
A National Study of Resource-Based Relative Value Scales for Physician Services

Volume 2

Background

Research Design and Study Organization

Pilot Analysis: Service and Procedure Work

National Survey: Service and Procedure Work

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A NATIONAL STUDY OF RESOURCE-BASED
RELATIVE VALUE SCALES FOR PHYSICIAN SERVICES

FINAL REPORT

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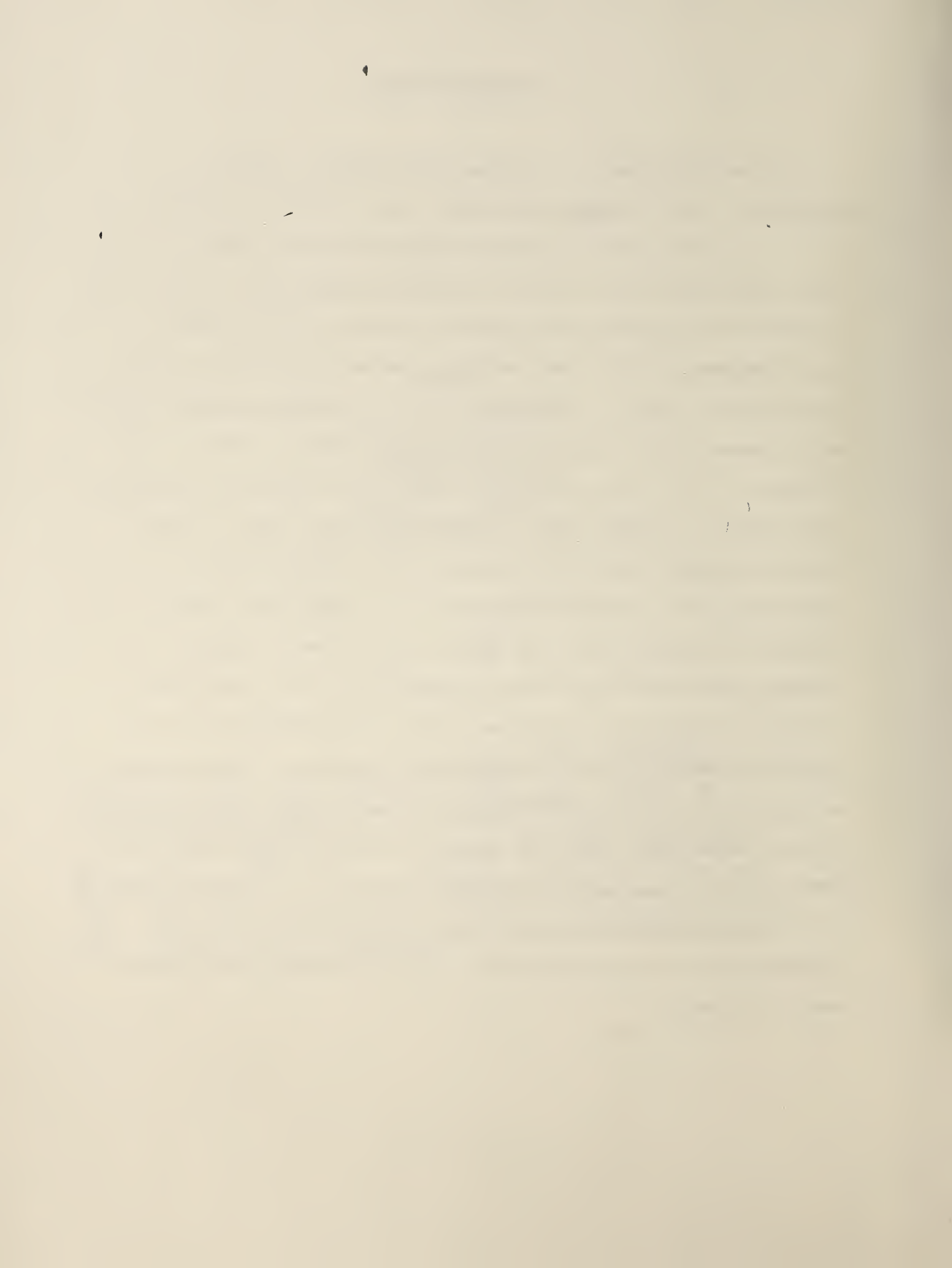
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Symbols

- Data not available
 - ... Category not applicable
 - Quantity zero
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Chapter 2

Background

2.1 Background

Rapidly growing expenditures for physician services have compelled the government to control the rate of growth of medical costs. Policymakers and researchers alike are exploring alternative methods of paying for physician services that are both fair and equitable. In this context, the Resource-Based Relative Value Scale (RBRVS) has been developed as one alternative approach.

The development of relative value scales for the payment of physician services, however, is not a new approach. This chapter reviews the background of physician payment for Medicare services and the evolution of alternative relative value approaches. Finally, the history of the RBRVS methodology is traced and summarized.

2.2 Present Physician Payment Method: Customary, Prevailing, and Reasonable Charges

Medicare currently reimburses physicians for their services according to customary, prevailing, and reasonable charges (CPR), a variant of the usual, customary, and reasonable (UCR) reimbursement system used by Blue Shield plans and many commercial health insurance carriers. The CPR method compiles the actual charges made by physicians in a given base period. The "customary charge" of each physician who treats Medicare patients is defined as the physician's median charge for that

service during the base year. The "prevailing charge" for groups of physicians in the same specialty within a given geographical area is defined as the 75th percentile of the customary charge for a given service, weighted by frequency. Since 1972 the annual rate of increase for prevailing charges has been limited by the Medicare Economic Index (MEI). The MEI is based on a number of national economic factors related to physician overhead costs and net income. It was first implemented in fiscal year 1976, based on 1973 prevailing charges.

Since 1969, the federal government has attempted to control the rate of increase in physicians' fees for Medicare services in several ways. Prevailing charges were originally set at the 90th percentile of customary charges, but were reduced in 1969 to the 83rd percentile and in 1971 to the 75th percentile. The MEI was added, as noted earlier, in 1972. Congress has also enacted public laws requiring prevailing charge screens to be based on the customary charges in place during the preceding year. In 1984, Congress froze both customary and prevailing charges.

The prevailing charge, as modified by the MEI, sets the ceiling on Medicare payments for a given procedure in a given year. Only within that limit does Medicare recognize the customary charges set by individual physicians. Over time, the customary charges of many physicians, which are rising faster than the MEI, reach the prevailing charge as limited by the MEI (Paringer, 1981). Hence, the MEI over time tends to impose a fixed price for the majority of physicians in a geographical

area. As a result, the CPR becomes a fixed fee schedule for these physicians whose charges exceed the prevailing charges.

2.2.1 Criticism of Current CPR Method

The CPR method of reimbursement creates a number of problems, which can be grouped into four general categories. First, CPR tends to promote fee inflation. The physician whose fees are below the prevailing charge has an incentive to increase his or her customary fees to the maximum allowable level.

Second, CPR promotes inequities between new and experienced physicians. New physicians entering into practice are allowed to set customary fees equal to the median fee of their particular specialty group. (Most Blue Shield plans, for example, allow new doctors to set their fees in the 80th to 90th percentile of the established customary fees.) Experienced physicians' fees, however, are controlled more tightly, which often results in lower fees than for new physicians.

Third, CPR fosters a downward stickiness of fees. The current CPR method encourages physicians to continue charging their old fee, regardless of changes in technology, risk, and time input. Thus, once "new" procedures have become routine, as knowledge is accumulated or technology improved, the charges for these procedures were not reduced.

Finally, CPR tends to compensate physicians for diagnostic and surgical procedures at a higher rate per unit of standardized time than for office visits or consultations involving

history-taking, counseling, or other cognitive services (American Society of Internal Medicine, 1981). The higher payment levels may be due to the fact that surgical services and diagnostic tests have long been covered by health insurance. A result of this uneven payment rate is to encourage the use of high cost technical procedures to diagnose and treat illnesses. These technical procedures often require the patients to be hospitalized.

2.3 Determinants of Physician Market

What are the economic conditions that influence the physician market? According to economic theory, in a competitive market buyers and sellers act independently; prices are determined in accordance with levels of supply and demand. Both buyers and sellers are free to choose to deal with whomever they wish, with no one having the power to force acceptance of his terms. If, in these circumstances, some sellers should try to keep their prices substantially higher than their costs, other sellers willing to accept a lower profit margin will enter the market and drive prices down. Assuming that these dynamics pervade the economy, economists have shown that prices will yield an efficient use and distribution of resources (Samuelson, 1982).

Certain conditions define a competitive market. With medical services in mind, we state them this way: 1) consumers must have knowledge and time enough to shop and choose; 2) they should pay for the services out-of-pocket so that their own true

preferences (relative valuations) can be revealed; 3) sellers must compete on price; and 4) there should be no restrictions as to who can provide the services (i.e., buyers decide this through their purchasing behavior).

The market in physician services, however, does not meet the conditions that define a reasonably competitive market. First, widespread health insurance coverage reduces patients' sensitivity to the fees physicians charge. Patients generally choose physicians and services with little regard to price. The presence of insurance also distorts the price structure because some services are covered while others are not.

Second, patients often do not have adequate knowledge on which to base their choice of medical service or to judge the technical quality of the service provided. Patients frequently place trust in their physician to make the best medical decisions for them. It is not uncommon for physicians to operate in an autonomous position, with few of the checks and balances provided by traditional competitive fees.

Finally, because medical care affects individuals' well-being and survival, legal restrictions limit who can provide medical services, admit patients to hospitals, and prescribe drugs. While these restrictions protect the patient from unqualified providers, they also tend, from an economic point of view, to give monopoly power to the medical profession.

In light of these "failures" of the medical marketplace, charges (prices) appear to be distorted. Policymakers, third-

party payers, and many physicians are exploring alternative payment bases that do not rely solely on physician charges (Jencks and Dobson, 1985). One approach, which is developed in this proposal, is to base reimbursement on the resource-inputs to the various services and procedures performed by physicians. This approach utilizes the concept of a relative value scale.

2.4 Historical Background of Relative Value Scales (RVS)

The development of relative value scales dates back to the early 1950s. The prototype was published by the California Medical Association in 1956 as the California Relative Value Studies (CRVS). Subsequent editions, with revisions, followed in 1957, 1960, 1964, 1969, and 1974.

In all editions of CRVS, physicians' charges have provided the basis for calculating unit value. From 1956 through 1964, the California Committee on Fees obtained some charge data from a direct survey of California physicians. The committee determined relative values from the modal and the median value of charges for each procedure. Beginning with the 1969 edition, the Committee developed a unit value for each procedure based on median charges reported by California Blue Shield plan. Thus, all the most recent editions of the CRVS are based strictly on charges, as are the scales derived from it.

The influence of the CRVS on medical fee scales nationwide was documented in the Senate Government Affairs Committee report (1979). The CRVS has been widely distributed by the California

Medical Association. By 1979, approximately 300,000 copies of the 1964 and the 1969 edition were in circulation, with about 160,000 of these in the hands of other than CMA members across the nation (U.S. Senate Committee on Governmental Affairs, 1979).

Third party payers have widely used the CRVS to establish fee schedules. Ten states have been identified as using the CRVS-based fee schedule for their Medicaid programs. The CRVS has also been the basis for RVSS established by more than 40 state medical societies. Blue Cross/Blue Shield plans have used the CRVS, as have commercial insurers. Foundation plans and individual practice arrangements have also used the CRVS or a modified version to set the unit values of procedures, and HCFA employs a relative value scale for setting some fee levels under the Medicare program. In October 1980, for example, HCFA's Atlanta Regional Office directed all Medicare carriers in that jurisdiction to develop charge-based relative value scales for filling in gaps in customary and prevailing charge screens.

In the late 1970s, however, certain actions initiated by the Federal Trade Commission virtually halted the development of relative value studies (Havinghurst and Kissam, 1979; Pfizenmayer, 1982; Pollard, 1983). Nevertheless, many physicians and third party payers continue to use either the CRVS and its successors or fee schedules based on the CRVS. The latest relative value scale, compiled mostly from charges, is the 1986 Florida RVS.

2.5 Alternative Methods of Constructing RVS

A relative value scale can be developed in several different ways and may be based on any one, or a combination, of at least six factors, including:

- physicians' historical charges;
- consumers' willingness-to-pay;
- physicians' assessment of the worth of a procedure;
- benefits to society;
- shadow prices; and
- a consensus/negotiation process.

As already noted, because of consumer ignorance about health care matters, widespread insurance coverage, and the urgent and fearful nature of some illnesses, we do not think that physician's historical charges can be used to develop an equitable reimbursement system.

Alternatively, many physicians have argued that the value of a service should be based on what it is "worth." Worth, however, can be defined in at least two ways: worth to the patient or worth to the physician. Willingness to pay is one measure of worth to the patient, but we have already discussed the limitations of this concept in medical services. Also, physicians have been able to vary their fees according to a patient's ability to pay, which constitutes price discrimination. Worth defined solely in terms of the physician's valuation, on the other hand, would create professional dominance, ignoring the benefits to the patient or society. Thus, the measure of worth

appears to be exceedingly complicated and laden with value judgments. The concept is neither well defined nor well enough developed at this time for this approach to be useful.

Another method which has frequently been suggested is to incorporate the benefit to society into a relative value scale. This is a noble idea, but translating it into operation has stymied researchers and policymakers alike. First, an enormous amount of information as to the efficacy of each procedure is required. At the moment, this information simply does not exist. Second, while comparison of efficacy within a disease category is theoretically possible, comparisons across diseases are much harder. The development of quality adjusted life is at its infancy. Economic values are inherently limited and biased against the poor and elderly. Lastly, this method would represent a drastic departure from the current physician payment system. To move from the current payment system to one where the benefit to society is taken into account would require extensive major research, beyond the scope of this project.

Shadow prices may also be used in determining relative values for physicians' services. Here, shadow prices refer to the market-determined prices for physician services under perfect competition. Jack Hadley, et al., have analyzed this method for determining prices, however, and have concluded that it is not technically feasible to calculate the shadow price of physician services (Hadley, 1984). Thus, while shadow price appears to be an appropriate concept, it cannot be made operational in

establishing physician fees.

Finally, relative value scales for physicians' services can be established through a "consensus" or negotiation process. This type of approach has been proposed by several health policymakers and researchers. There are several variants of this approach.

Roe (1981), echoing many of the earlier criticisms of the UCR system, proposed that pay schedules be negotiated between the carriers and experienced representatives from each specialty group. These negotiations would include periodic review and updating as medical circumstances and conditions changed. Later, Roe (1985) elaborated on the development of a "rational remuneration" system based on "suitable" income levels for specialties. Roe proposed the development of a multidisciplinary commission comprised of representative of the medical specialties and other interested parties to discuss and develop enumeration scales for each specialty.

Caterpillar Corporation has developed a negotiated fee schedule to reimburse surgeons. This system, according to Egdahl and Hertenstein (1987) involves discussions between representatives of Caterpillar and groups of physician providers to obtain a consensus on billing practices and agreement on the relative degree of difficulty of various surgical procedures. Based on these agreements, Caterpillar negotiates with physicians for a fee guide, taking into consideration access and quality of care issues.

In still another variant of the negotiated approach, Hadley and Berenson (1987) discuss a relative value system based on incentive-neutral fees. In this approach, physicians are asked to assess whether each service considered is a relative financial "winner" or "loser." By determining the point for each service between financial winning and losing, the authors argue, an incentive-neutral set of fees can be developed which reduce the odds of a conflict of interest between physicians' financial incentives and patients' medical and financial welfare.

Negotiation approaches, however, raise two fundamental problems. First, while they aim for a technical solution, their success requires the participation and commitment not only of physicians, but of all parties whose values and interests ought to be accommodated. In effect, the solutions that are achieved in these discussions are political solutions or compromises among the participants. Without the participation and commitment of all concerned parties (e.g. patients), any negotiation or consensus will fail to resolve underlying conflicts and disagreements and may be likely to fail.

Second, without an objective analysis of technical information, consensus or negotiated solutions would be hard if not impossible to achieve, and will not necessarily remedy the distortions which exist in the current fee structure. Even if "consensus" is achieved, however politically successful, it may represent no objective improvement over the status quo. Thus the process would not enhance public objectives of reducing cost

inflation, and promoting efficiency and fairness. As a viable alternative to these approaches, we have developed the resource-based relative value scale.

2.6 History of the Resource-Based Relative Value Scale

For the most part, nearly all the relative value scales developed to date have been based on physicians' charges. These charge-based relative value scales, without modification, simply institutionalize whatever price distortions already exist in the imperfect marketplace. Consequently, if it is to be more equitable and rational, a payment system should rest on a method that gives the system independence from existing charges.

A new method to establish relative values based on other than charge data was developed by Hsiao and Stason (1979). This method bases the relative values of medical and surgical services on the resource costs involved in the production of these services. The model used to compute the relative values of physician services should try to approximate what a market would do if it were competitive. Thus, for example, a resource-cost-based relative value scale would, if adequately constructed, be neutral with regard to the selection of diagnostic or therapeutic modalities; in other words, the payment system would aim to create a "level playing field."

Hsiao and Stason defined the resource input value for each procedure as a combination of five resource inputs; (1) operative (or encounter) time, (2) pre and post operative (or encounter)

time, (3) complexity (intensity) per unit of time in performing the service or procedure, (4) overhead costs, and (5) the amortized value of the opportunity cost for specialty training after medical school. In their exploratory study, Hsiao and Stason assessed the relative resource input of 27 procedures commonly performed by physicians in five specialties (general surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery and urology).

The approach to quantifying work was to measure the duration and the complexity per unit of time of each service. Measures of time were obtained from published data on skin-to-skin time of surgical procedures. Measures of complexity were obtained by interviewing surgeons for their subjective estimates of various procedures' relative complexity per unit of time. The work of each procedure was then calculated as the product of the separately obtained values of time and complexity.

Examination of the data revealed a high degree of correlation between the duration of a procedure and physicians' estimates of its complexity per unit of time. As a result, Hsiao and Stason questioned whether physicians could hold time constant when providing estimates of complexity. Overlap between time and complexity, Hsiao and Stason hypothesized, led to an exaggeration of their product.

A second study of resource-based relative values was conducted by Hsiao and Braun in 1984 (1985). This work expanded upon the methodology of the previous study and collected

additional data from 110 physicians in Massachusetts. Moreover, Hsiao and Braun added four nonsurgical specialties (internal medicine, pediatrics, family practice, and radiology) and two surgical specialties (otolaryngology and cardiovascular/thoracic) to the five specialties in the Hsiao-Stason study.

In the second study, Hsiao and Braun tried to avoid the confounding overlap of time and complexity estimates by obtaining direct global estimates of work, incorporating both dimensions. The estimates of work were elicited using a closed numeric scale of 1-100, assigning the most difficult procedure a value of 100. The results appeared to be unrealistically low for lengthy procedures. The longer a procedure, moreover, the more the work seemed to be underestimated. The interviewed physicians seemed to Hsiao and Braun to have given inadequate weight to the duration of the procedures.

The Hsiao and Braun study also actively involved physicians both in technical consultation to the project and in data collection efforts. Data on global difficulty were obtained through interviews with physicians who were asked to judge the relative overall difficulty for a set of services and procedures they performed. This study also collected data on complexity defined as the intensity of physical and mental effort involved, clinical judgment required, and the technical skill required.

In both prior studies, the physicians' estimates were strikingly consistent, particularly with respect to the rank-ordering of procedures. However, both studies produced primary

data that the investigators and the physicians who served as technical consultants considered to be unreasonable estimates of work. Hsiao and Braun's measure of reasonableness was whether the estimates of work conform to the "reality" of work input as physicians experience it.

Two other major findings can be summarized from the Hsiao and Braun study. First, the authors found large discrepancies between charge-based and resource-based relative values when they evaluated the implicit value of office visits and invasive procedures. That is, the results showed that ratios of relative values for office visits to relative values for invasive procedures on the resource-based scale exceeded corresponding ratios from the charge-based scale. This finding suggested that office visits for evaluation and management of patients are undervalued in relation to invasive procedures. Estimates indicate that charges and payments for invasive procedures are, on the average, two to three times higher than those for medical evaluation and management services per unit of resource input. In addition, the study revealed that technical diagnostic procedures such as laparoscopy, colonoscopy, and rigid sigmoidoscopy are also paid two to three times that paid for office-based medical services per unit of input.

A second set of findings from the Hsiao and Braun study showed that surgical procedures that are of moderate difficulty (and often the most commonly performed) are better compensated, as measured by the resource inputs required, than the most

complicated (and less frequently performed) procedures.

A plausible explanation for this phenomenon is that as technological efficiency improves for a procedure, there is not a corresponding reduction in the charges or payments for that procedure. As technology advances, some complicated or risky procedures, which have improved in their efficiency or risk, have not been reduced accordingly in their price. As a result, these procedures are priced too high (e.g., simple lens extraction and insertion of pacemaker) in relation to other services. Hsiao and Braun hypothesize that this outcome is the result of a perverse property of the current payment system; the system offers no incentive or market pressure for physicians to lower their prices when technology and efficiency have improved.

These studies showed that an RBRVS was useful, but several issues were not adequately addressed: 1) the number of procedures and specialties selected for the studies was limited; 2) the sample of physicians from whom information was collected was very small and restricted to Massachusetts; 3) the investigators did not examine the effect of variations in the training and experience of physicians in performing a procedure; and 4) variations in work patterns, such as those found in academic versus community settings resulting from the use of interns or residents for pre-, post-, or intra-operative management of patients, were not analyzed.

Nevertheless, in spite of the shortcomings of these early studies, some representatives of 11 specialty societies in

Massachusetts observed that the RBRVS more accurately represents the resource input required for different procedures than the California RVS. In general, the RBRVS produced higher relative values for the most complicated procedures than the CRVS, and generally gave a more accurate assessment of the relationships between and among the services and procedures performed by the various specialties.

2.7 Legislative Mandate

In the Consolidated Omnibus Reconciliation Act of 1985 (Public Law 99-272), Congress mandated the Secretary of Health and Human Services to develop a relative value scale that establishes a numerical relationship among the various physicians' services.

Harvard School of Public Health submitted a proposal to the Health Care Financing Administration to develop a national relative value scale based on physicians' resource-inputs. The study, involving the cooperation and assistance of the American Medical Association and many major national medical specialty societies, was funded and carried out over the past 30 months.

Chapter 3 **Research Design and Study Organization**

3.1 Scope of the Study

The study is designed to achieve three major objectives. First, to develop resource-based relative values (RBRVSs) for most of the services delivered by 18 medical and surgical specialties. The unit of analysis, for which the resource inputs will be measured, are the services as enumerated by the Physician's Current Procedural Terminology, 4th ed. (CPT-4).

A second major objective of the study is to take these resource-based relative values (RBRVs) developed within each specialty and locate them on a common scale. This will make RBRVs across specialties comparable and permit one conversion factor to convert them into monetary units.

A final major objective of our study is to subject the methodology and preliminary results to review by experts in medicine, psychology, economics, statistics, and health policy in several fields. These fields include: medicine, consumer affairs, government, third party payers, employers, and unions.

The 18 specialties included in the study originated in two groups. Initially, the study was funded by the Health Care Financing Administration (HCFA) to produce an RBRVS for the majority of services performed in the following twelve medical and surgical specialties: anesthesiology, family practice, general surgery, internal medicine, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, pathology, radiology, thoracic/cardiovascular surgery, and urology. These

specialties were selected by the project after consultation with representatives from the federal government and organized medicine and, generally, represent those specialties with high numbers of physicians and Medicare and Medicaid dollars expended.

Later, six additional specialties were included in the study at their request with funding from other independent sources. These specialties are: allergy and immunology, dermatology, oral and maxillofacial surgery, pediatrics, psychiatry, and rheumatology. These specialties were funded through independent nonprofit foundations, the National Institute of Mental Health, and corporations.

3.2 Overall Approach

The study aims to develop a resource-cost-based relative value scale by investigating the resource cost inputs of physician services and then developing methods to measure them. To achieve these objectives, we needed to systematically investigate what practicing physicians consider to be the factors that constitute their work input and other resource costs. Based on this information, it was then necessary to develop methods and collect data appropriate to measure these various factors of resource costs.

3.2.1 Background

In our previous research we have assumed, a priori, that one major resource input into physician services consists of the

physician's own time.¹ For this time, however, we have argued that the intensity of the work per unit time can and does vary, sometimes quite dramatically. Therefore, our early general model of physician resource input was:

$$TW_j = (t_j, i_j)$$

where

TW = total work (i.e., the relative resource input by the physician for the j th service);

t_j = time input for the j th service; and

i_j = intensity of effort per unit time for the j th service.

It is readily apparent that time (t) can be measured objectively, but we have long recognized the difficulty in obtaining measures of intensity (i) with objective data. Measuring intensity requires the expert judgment and advice of physicians who perform these services. In our previous two studies, our goal was to try to obtain reliable and valid estimates of intensity.

From past research we learned, however, that reliable values of intensity are not easily obtained. Physician respondents (in the face-to-face interviews) gave different valuations of intensity depending on which measurement methods were used. In the 1979 study, for instance, Hsiao and Stason, using an open

¹ Because this discussion relates only to physicians' work, the other components of the RBRVS, practice costs and the amortized cost of specialty training, are not considered in this discussion.

numerical scoring method, found that physicians can consistently rank order the intensity of services. These numerical scorings of intensity, however, were highly correlated with time. Moreover, the range of intensity scores varied greatly among specialties. For the very small number of services studied, the intensity for the most difficult service is 12 times more intense than the easiest. These multiples were beyond what our medical experts consider reasonable. When, in a second step, the estimated values for intensity were multiplied by the time to calculate total work, the total work for many services in the 1979 study were clearly too high as judged by physicians. The authors hypothesized two reasons for the discrepancies in the results: 1) the method used to obtain the ratings of intensity was not appropriate, or 2) physicians cannot rate intensity separately from time.

In a subsequent study conducted by Hsiao and Braun (1985), 110 physicians were interviewed with a closed numeric scale method to obtain physicians' global ratings of total work, called "total complexity" in that study, and including both time and intensity in a one-step fashion. Using a closed scale approach, the implicit values of intensity were again found to be unreasonable. When a panel of 30 medical experts reviewed the ratings given by physician respondents, they concluded that the values of total work for many difficult services were relatively too low while the values of many easy services were too high. It appeared that the implicit values of intensity, calculated by

dividing total work by time, were inversely related to the known level of difficulty related to the service. The methodology of this study, in contrast to the first, appeared to lead to physicians' giving inadequate weight to time or intensity. Given the findings, we reassessed our approach to measuring work and the dimensions of work.

3.2.2 Definition of Work and its Dimensions

In the current study, we approached the problem of defining and measuring work both qualitatively and quantitatively. With the assistance of measurement psychologists, we conducted a systematic re-examination of work and its dimensions, resulting in a major revision of our methodology. Instead of accepting that work consisted of two independent factors (time and intensity), we asked physicians in extensive face-to-face qualitative interviews to determine the important dimensions that made up their work.

A psychologist interviewed 20 experienced practitioners in various specialties in the greater Boston area. These interviewed physicians typically described the important variables in their work as 1) time, 2) mental effort, 3) knowledge, judgment and diagnostic acumen, 4) technical skill, 5) physical effort, and 6) psychological stress. Further discussions and review by TCG panelists tended to confirm these dimensions.

Asked what determined the level of work input for individual patients, the interviewed physicians commonly cited the complexity of the patient's problem, the seriousness of the patient's condition, uncertainty about the diagnosis or treatment, and possible iatrogenic harm to the patient. The relationships among the patient's condition, the uncertainty of medical science, and work are illustrated in Figure 1.

From the information gathered in these interviews, we initially hypothesized that work was a function of five dimensions: time, technical skill, physical effort, mental effort and judgment, and stress. Thus, in our pilot study we asked physicians to rate all five dimensions. Our analysis of the pilot survey results, which is presented in Chapter 4, confirmed that these five dimensions of work indeed explained virtually all the variance in total work.

We recognized, however, that the dimensions of work were probably not mutually exclusive and, thus, might be highly correlated. Correlation analysis among the dimensions bore this out. We found that technical skill and physical effort were highly correlated. The correlations between these two dimensions for the four specialties surveyed in the pilot survey, all exceeded 0.93.

To obtain and evaluate the ratings of work for the services studied, we had to collect a large volume of data from the surveys. On the other hand, to achieve high response rates and thoughtful answers from respondents, we also needed to limit our

survey to 30 minutes. Thus, we decided to survey only about 23 services for each specialty, and measured only what we postulated to be the most important dimensions of work. Using the information obtained from the pilot study and other exploratory data analysis, including multi-dimensional scaling, led us to combine mental effort and judgment into a single dimension and technical skill and physical effort into another. Thus, we ultimately postulated the dimensions of work as (1) time, (2) mental effort and judgment, (3) technical skill and physical effort, and (4) psychological stress. Using the last three dimensions in lieu of "intensity" has simplified defining and measuring work as well as validating the results. For the national survey, we asked physicians to rate total work plus four possible dimensions of work: time, technical skill and physical effort, mental effort and judgment, and stress.

3.2.3 Magnitude Estimation

As noted above, mental effort, judgment, technical skill, and stress are difficult to measure objectively. Consequently, we have to rely on subjective judgments of expert opinions of the practicing physicians who perform particular services. Reliable and valid measurement of subjective judgments is difficult to obtain, however, and the method of measurement is crucial.

Our central approach in the present study was to obtain global ratings of the relative work of selected services, embracing all the important dimensions of work. That is, we

obtained ratings of all the separate dimensions of work mentioned above as well as direct ratings that summarized the total work involved for each service. We then sought to examine these ratings in terms of separate ratings of the individual dimensions to determine whether or not our direct measures of work are valid measures of all its important parts.

After consultation with measurement psychologists, statisticians, economists, and sociologists, we selected magnitude estimation as the best means to obtain subjective assessments of work and its dimensions.

Magnitude estimation is a method designed to measure subjective perceptions and judgments. This method uses a ratio scale to measure subjective perceptions and judgments, and its capability to obtain reliable, reproducible, and valid results has been demonstrated (Stevens, 1985).

The method allows respondents to use their own scales to rate items relative to some reference item, without imposing fixed upper or lower limits. Respondents can rate an item as high or low as they believe necessary to reflect reality. Magnitude estimation uses a ratio scale rather than a cardinal scale. For example, earlier research on magnitude estimation demonstrated the close correspondences between physical measures of sensation and subjective ratings of perceptions, such as between the intensity of light and subjective rating of brightness. Moreover, it has been found reliable in replicating results across many groups of people.

In our pilot and national surveys, discussed in the following chapters, physicians were instructed to use a particular service as the reference item or standard. In general surgery, for example, the standard was an uncomplicated indirect inguinal hernia repair in a 45 year old male. These standards varied in each specialty and are listed in the questionnaires in Appendix I.

The standard was assigned a value of 100 and each service for a specialty was compared to the standard for total work and each of its dimensions. Physicians were instructed that if they judged a service as twice as much work as the standard, they should give a value of 200. A service half as much work should be given a value of 50, one five times as much work should be given a value of 500. The data collected using this method served as the primary data for developing the RBRVS.

3.2.4 Project Organization

It was clear that accomplishing these tasks required the skills and expertise of not only clinicians in the various medical and surgical specialties being surveyed, but also experts with knowledge in economics, measurement psychology, statistics, sociology, and survey research.

One of the difficult and demanding aspects of organizing and managing the project was that the interaction among the experts and the development of the methods and data needed to occur simultaneously. Suggestions and comments made by the medical and

technical experts needed to feed into the development of the methods and data collection, and conversely, empirical analyses derived from the technical investigation needed to be reviewed and criticized by these experts.

To successfully accomplish these tasks, the study was structured along two parallel processes. One process included the technical development of the methods to measure the components of the RBRVS. The other portion of our process, which guided the technical portion, was our formal consultation with the physicians who served on our technical consulting panels.

In the following sections, we first overview the major technical tasks of the project. This summary will provide the reader with an overview of the major research issues addressed in developing the RBRVS. These technical aspects are analyzed in detail in the following chapters. This overview of technical issues will also provide the reader with a general understanding of the tasks presented to our technical consultant group members. In the second portion of this chapter, we detail the formal consultative process we employed to elicit expert medical input and comment.

3.3 Overview of Technical Component

To measure the resource costs in performing physicians' services, we developed a model that measures these resource inputs to physicians' services. One of these inputs resources we

measure at the service level -- the total work of the particular service. Total work encompasses not only the time spent before, during and after the service, but also the intensity of that time. We argue, and our empirical evidence verifies, (Hsiao et al.) that time alone is not sufficient to reflect the total work input of physicians. The fact that the intensity of that time can and does vary substantially among services suggests it needs to be taken into account when measuring physicians' work input.

Two other factors are also included as physician resource inputs. These are measured at the specialty level and include: overhead practice costs and opportunity costs. Overhead practice costs are those expenses of medical practice necessary to provide medical care in the specialty. These expenses include such expenses as office space, employees, equipment, malpractice insurance, and so on. Opportunity costs represent the income foregone by physicians when they undertake additional post-graduate training to become qualified specialists.

These three factors are combined to produce the resource-based relative value of a given medical service:

$$RBRV = (TW) (1 + RPC) (1 + AST)$$

where

TW = total work input by the physician;

RPC = an index of relative specialty practice costs;

and

AST = an index of amortized value for the opportunity cost of specialized training.

Our method depends on our ability to define and quantify the resource costs of physicians' services with reliability and validity. By reliability we mean that measurements are reproducible. By validity, we mean that those measures are "statistically consistent" and also accord with the work of performing physicians' services. Statistically consistent measures quantitate the relationship between ratings of work and its dimensions, such as time, mental effort, technical skill, and stress. We define reasonableness as how the quantitative measurements conform to the panelists' clinical experience.

To develop these factors for the RBRVS, we segmented our technical work into a number of distinct research tasks which are ultimately combined to form the final RBRVS. These research tasks are outlined in the following sections and discussed in detail in the later chapters.

3.3.1 Measuring Intra-Service Work

The work performed by physicians represents a major input to medical services. As the Physician Payment Review Commission noted in their recent report, "The most difficult task in developing a relative value scale based on resource costs is that roughly half the costs reflect physicians' time and effort." (PPRC, 1988) To facilitate the measurement of work and to keep surveyed physicians from having to juggle too many variables simultaneously, we divided the work of medical services into those activities that occur 1) before, 2) during and 3) after the

clinical encounter (or invasive procedure). We have named these three discrete periods of activities pre-, intra-, and post-service periods, respectively.

Our previous investigation has shown that, when estimating work, physicians had difficulty providing independent measures of time and intensity (Hsiao and Stason, 1979). Our goal in this project is to develop a method for measuring these partly subjective entities reliably and validly. Some of the questions we sought to answer were: (1) What is physician work? (2) Can relative work be measured reliably and validly? (3) What are the dimensions of work input for each service and how do the dimensions relate to work?

Work is modeled as a function of four dimensions: time, mental effort and judgment, technical skill and physical effort, and stress. We found that physicians can give reliable and valid ratings of intra-service work. All four dimensions are important and statistically significant in predicting work. The discussion and analysis of intra-service work is presented in Chapters 4 and 5.

3.3.2 Cross-Specialty Comparison

Relating the relative value scales of different specialties to one another is a major objective in the study. Because we chose not to ask individual specialists to rate the work of unfamiliar services, cross-specialty comparison presents a difficult problem. Surgeons, in particular, questioned whether

we could compare services involving evaluation and management, such as making a diagnosis or designing a strategy for therapy, with services involving invasive procedures.

In this component of the project, we have concluded a structured process with members of our cross-specialty consulting panel in which they identify services performed in essentially the same way across different specialties. In addition, the cross-specialty panel has identified pairs of services in different specialties that are believed to be equivalent in time and intensity.

By employing this approach, we are able to develop a matrix of "same" and "equivalent" services across specialties with a minimum of four services that are either the same or equivalent, connecting one specialty with another. Using a weighted-least-squares method, we have located all the links optimally on a common scale. The typical disagreement between intra-work on the common scale with the values on the specialty scales was only seven percent. In Chapter 6, we review the cross-specialty methodology and results.

3.3.3 Pre- and Post-Service Work

Non-physicians are most familiar with intra-service work such as office visits, operations, visits to the bedside in the hospital, and consultations. There is, however, much less visible work that occurs before and after a service. Before patients arrive, physicians often review patient records,

communicate with other professionals or with relatives, and prepare for particular services with their staffs. After seeing patients, physicians must document observations, diagnoses, and plans and consult with other professions, patients, and relatives. Primary care physicians, furthermore, undertake responsibility for their patients outside offices and hospitals and communicate with covering physicians through a seven-day week. They must review data that flow from tests, records, and the feedback of patients and often revise their decisions.

This pre- and post- service work is an essential part of the physicians' work. Yet, a paucity of objective data on the work involved outside the patient encounter makes this work difficult to study. While hospitals keep logs of the time that surgeons spend in the operating room, they do not keep data on the amounts of time spent providing preoperative and postoperative care. These visits may entail such diverse tasks as making diagnoses, discussing potential risks and benefits of surgery, and managing postoperative complications. Similarly, while internists may sense how much time and effort is involved in office visits with patients, they do not generally record the time and effort for such activities as telephoning patients and colleagues, reviewing records, or writing reports. Our research indicates that, depending upon the service category and setting, the average pre- and post-service work represents between 26 and 46 percent of physician total work. The methodology we employed for pre- and

post-time and work and the results of this analysis are presented in Chapter 7.

An important issue, in dealing with pre- and post-service work is the issue of global billing. There are wide variations in the way physicians bill for their services, especially for hospital invasive services. For the same service, for example, some physicians submit global bills for the entire episode of care related to the service, while other physicians bill separately for different segments of the service (i.e. the office visits before the service, the service in the hospital, and the office visits following the service). The Physician Payment Review Commission (PPRC) has recognized this difficulty and is developing generic descriptions of global services (PPRC, 1988).

In developing the RBRVS, we were faced with the perplexing problem of developing a methodology that could accurately measure the RBRVS for these different circumstances and, yet, would be responsive to the potential uncertain needs of health care researchers and policymakers. Rather than trying to define the appropriate billing package for each service, we broke our services into their smallest unique parts and developed RBRVs for each of these distinct segments of the service. Using this approach, makes it possible to reassemble the RBRVS to reflect whatever physician billing packages PPRC or other interested parties may desire. For example, if an uncomplicated cholecystectomy is defined as requiring one comprehensive office visit, new patient, prior to the operation and two intermediate

office visits, established patient, after the operation, the RBRV for the cholecystectomy could be combined with the RBRVs for these office visits to create a global RBRV for cholecystectomy. More specifically, for HCFA, we recognize that their definitions of surgical procedures typically include the post-discharge follow-up care in the global package. To avoid any downward bias in RBRVs for services provided in a global package, NCFA needs to include RBRVs for all services associated with these global packages in any reimbursement calculations.

3.3.4 Extrapolation Methodology

Our national survey of physicians provided extensive data on the total work and dimensions of work associated with some 407 different services. These 407 services are but a fraction -- albeit an important one -- of the total number of services that are performed by physicians. In 1986, these services accounted for 36.7 percent of all Medicare submitted charges. However, according to CPT-4, there are approximately 7,000 definable services; about 1,200 codes are applicable to orthopedics alone. It would be difficult and costly to survey physicians to obtain direct measurements for more than about two dozen services per specialties. We therefore developed methods that estimated the relative values of unselected services by extrapolating from the values obtained for our selected services.

This extrapolation method used available charge data without building their inherent distortions into the extrapolated scale. We used small, homogenous families of services as the basic units for the extrapolations and assumed the charges reasonably indicate the work within such families. In Chapter 8 we discuss the extrapolation methodology and results.

3.3.5 Measuring Practice Costs

A major resource input for each service delivered by a physician is the overhead cost associated with the service. In 1986, according to American Medical Association data, mean practice costs averaged 50 percent of the average physicians' gross revenue (AMA, 1988). To account for differences in practice costs among specialties, we have developed a measure of practice cost for each specialty. The practice cost method and specialty practice cost components are discussed in Chapter 9.

3.3.6 Opportunity Costs

A final technical component addressed by the study is the measurement of opportunity costs of training. These costs are the costs incurred by physicians due to additional specialty training beyond that required to practice as a general practitioner. The construction of this component is presented in Chapter 10.

3.4 Consultative Process

We recognized from the inception of this study that the collection of resource-input data, their analyses, and their interpretation required medical expertise. To provide the necessary consultative input, we developed formally structured consultative panels. The first group of panels we termed the technical consultative groups, the other set of panels was named the cross-specialty panel.

3.4.1 Technical Consultant Groups (TCGs)

To obtain requisite medical knowledge on the current practice of medicine, we formed TCG's made up of representatives of all 23 specialties of the American Board of Medical Specialties and 8 sub-specialties of internal medicine and oral and maxillofacial surgery. These specialties and their representatives are listed in Table 1.

3.4.1.1 Functions

The TCGs performed five essential functions:

- Discussing the conceptual basis, methodology and uses of the resource-based relative value scales. In particular, provide advice and comments on:
 - How can the approach and methods be improved?
 - What are the major strengths and weaknesses of this approach?
 - What are the limitations of the RBRVS approach if it is applied to their specialty?
- Assisting in the identification and selection of procedures or services to be studied in depth through a national survey. The investigators intend to include the most frequently performed services or procedures,

emerging procedures, and services/procedures that represent a broad spectrum of relative complexity.

- Advising the investigators about specific features of specialty practices: professional skills needed, stress encountered in practice, organizational demands, etc.
- Reviewing the reasonableness of the data collected such as time, complexity, training, practice costs, etc., after the national survey is completed.
- Reviewing the reasonableness and the validity of the calculated RBRVS based on the data collected.

3.4.1.2 Composition

TCG members were selected through the following process.

The American Medical Association, generally in consultation with other appropriate medical professional organizations, nominated two to three physicians for each slot on the TCG. These nominees were to represent a broad cross-section of physicians meeting the following qualifications:

- Personal Attributes:
 - Professional expertise, experience and stature in the specialty.
 - Capacity to listen, fair-mindedness, willingness and ability to seriously consider contrary views and evidence, and capable of digesting conflicting information.
 - Good judgment, and ability to provide constructive criticism.
 - Ability to articulate.
 - Willingness to commit time and effort to the project -- attend two all-day meetings in Boston. Panelists were expected to review preliminary data and papers (e.g., draft of background paper on the specialty, data on time, complexity, etc.)

- Distribution of members:
 - Practice settings (community practice, academic centers, HMOs, etc.)
 - Functions (Chief of Services, patient care)
 - Geographic regions.

The TCG panelists were serving as individuals, not as representatives of the organizations nominating them. In addition, we stated that physician nominees would serve as medical experts and consultants, and that their participation on the TCGs would in no way imply that either the physician or their nominating organization endorsed the project.

Investigators reviewed the nominations submitted by the AMA, and selected representatives based on their medical expertise, experience, professional experience, geographic representation, and practice background. In particular, we tried to insure that TCG members represented experienced practicing physicians in office, hospital, and other health care settings. Moreover, we selected physicians from a broad geographical spectrum to assure our technical input reflected practice diversities due to geographic locations.

3.4.1.3 Process and Agendas

During the course of the RBRVS project there were, of course, numerous activities and meetings that occurred. Table 2 presents a chronological listing of the major activities that took place during the course of the RBRVS study. In addition to these meetings described below, the TCG panelists were in

frequent contact with the project staff by telephone and mail. Materials were also sent to panelists for their review and comment between meetings.

First TCG Meeting

As shown in Table 2, the TCGs met in two series of meetings. The first series of meetings were held between June and July of 1986. A copy of the agenda is presented in Table 3. To prepare for these meetings and to help us as well as TCG members understand the nature of work in each specialty, we prepared a series of background papers. One of the background papers was a general overview of the RBRVS approach which included background materials on payment issues and concerns associated with the current method of paying for physician services. The scope and goals of the project were summarized as well as the limitations. A subsequent version of the paper was published in JAMA and is included in Appendix A.

In addition to this background paper, we prepared papers summarizing the work, training, practice patterns, and major professional activities of each of the 32 specialties that attended the TCG meeting. These papers included detailed reviews of the current literature and covered issues related to the manpower, training, reimbursement, and practice costs for the specialty. In addition, papers reviewed how physicians allocated their time in practice, the clinical volume for the typical practice, and the major types of patients and medical

problems encountered. A sample of the background paper for orthopedic surgery is included in Appendix B.

The initial meeting served several purposes. First, using the background materials, the TCG panelists were formally briefed about the goals, scope, and organization of the RBRVS study. We provided panelists with an overview of our research agenda (and our plans for future meetings and interactions). Comments, suggestions, and criticisms of the RBRVS study were raised and discussed.

Second, since physicians perform over 7,000 distinct services, as enumerated by CPT-4, we needed to select a smaller subset of 22 services per specialty for detailed data gathering. A large portion of each of the first TCG meetings was devoted to developing these representative lists of services for the surveyed specialties.

We structured the selection of services to be surveyed in the national survey along several dimensions. We asked panelists to develop lists of services that were current and in a form suitable for surveying physicians. To develop these lists, the TCG panelists were instructed to select services that fell into four broad (and not mutually exclusive) kinds of activities in their specialties. These activities included: (1) evaluation and management, (2) invasive, (3) laboratory, and (4) imaging and pattern recognition. In addition, we asked panelists to identify new emerging services that were likely to be important services in the future.

It was clear from our discussions with TCG members and our previous experience that direct use of many of the CPT-4 codes without explicit detail was too difficult for physicians to respond to. For example, an office visit could cover a wide range of patient care situations. Therefore, we asked our panelists to give representative vignettes for their specialty which related to the intermediate office visit. These vignettes contained more explicit detail about the office visit for the respective specialty. Panelists were instructed to follow specific guidelines such that: (1) each service would be understood as essentially the same by colleagues in the specialty; (2) a vignette that describes the average patient complexity; and (3) the most applicable CPT-4 code was attached to the service.

Following the meeting, the lists of services developed at each meeting were mailed to TCG members for further review and comment. The final list of services and procedures used for the national survey in each specialty are presented in Table 5.

After the list of services was completed, we asked the TCG panelists to assign the vignettes to the appropriate CPT-4 code. Our method of determining CPT-4 codes for vignettes is subject to several methodologic limitations: a) some panelists did not have detailed familiarity with the CPT-4 coding system. In some cases the codes applied by different panelists were not the same. Disagreements had to be resolved by further iterations and by consultation with the staff the AMA unit (the Division of Health

Policy and Program Evaluation) responsible for CPT-4; b) some commonly performed procedures must be billed under more than one code. For example, removal of a basal cell epithelioma from the face with intermediate repair, a common dermatologic procedure, must be coded under two codes, one for excision and the other for repair. The value for work, which was obtained as a rating for this service as a whole, must be allocated between the excision and the repair to be useful in the RBRVS; c) The codes for evaluation and management services tend to be broad and are defined in a way that makes interpretation variable. Despite the number and diversity of E/M services, fewer than 100 of the approximately 7000 codes represent evaluation and management services. Perhaps more importantly, they are defined in terms of the content of services (which can be difficult to apply, particularly when the same codes are used by different specialties), but not in terms of time, which would provide an objective way of determining the codes. We also found that panelists in different specialties used the CPT-4 codes for E/M services differently. (For details, see Chapter 12.)

A third goal of the first TCG meeting was to review the methodological issues related to the measurement of work. We discussed our methodology and discussed suggestions for modifications on our approach as well as other approaches. We also tested other approaches for measuring work. For example, we tested panelists' work preferences for different services by asking them to trade x number of A services for one B service; in

other words, measuring physicians' indifference curves to see if this might represent a useful approach for measuring work. At the first series of meetings, we also asked the panelists to rate different services in order to test the magnitude estimation method and to collect data on how many dimensions may constitute work. These data were analyzed to aid us in designing the survey strategy.

A final agenda-item of the initial TCG meeting was to have panelists identify services that may be performed in essentially the same manner by more than one specialty. These services were considered to be potential "cross-specialty" services, and these services would be used in our cross-specialty meetings which would take place in December.

A more detailed summary of the activities and discussion at each of the TCG meetings is presented in Appendix C and Appendix D. Readers are urged to refer to these summaries for a fuller discussion of the meetings.

Second TCG Meeting

A second meeting of the TCG panel was held during the summer of 1987. As can be seen from the chronology in Table 2, this meeting occurred after our national survey was completed. Therefore, we used much of the meeting to present the data collected from the national survey and preliminary results from the national survey for TCG panelists' comments and criticisms.

We began the evening session by updating the TCG members on our progress since the last meeting. The survey design for the national survey was discussed and questionnaires were distributed for TCG members' review. An overview of the practice cost method was then presented and problems and issues related to practice costs were discussed. The following morning we began by reviewing the methodology of the RBRVS and presenting statistics compiled from the national survey. Project staff reviewed the reliability and validity of the survey results in each specialty while TCG members reviewed and commented on these materials. The formula for the RBRVS was then discussed as well as the calculation for pre- and post-time.

In the later portion of the morning session, specialties separated into their respective specialties to discuss in detail their specialty's survey results. The values for total work, time, and the dimensions were distributed and discussed. Physician leaders, practicing in the specialty or familiar with the specialty, led these small group discussions while project staff observed the proceedings and raised related questions. We presented survey data on intra-service work, its dimensions, and within-specialty RBRVs to our panelists. We also presented to the TCG panelists the relative values based on charges from the Health Insurance Association of America, Florida Medicare Part B charges, and the California Relative Value Study for comparison. We asked panelists to respond, in writing, to the following: (1) Does the rank order of ratings for intra-service work seem

reasonable? (2) Does the range of intra-service work ratings seem appropriate? (3) Do the proportional relationships of one procedure to another seem reasonable? (4) Do the time data appear reasonable? and (5) Do the ratings for the other dimensions (mental effort and judgment, technical skill and physical effort, and stress) seem reasonable? (Again, reasonableness is defined as how the quantitative measurements conform to clinical experience.)

Further, we asked panelists whether the RBRVS for their specialty constituted an improvement over the alternative charge-based scales; what were the weaknesses of the RBRVS compared to the alternatives; and what steps could be taken to strengthen the RBRVS for their specialty. Following the panelists' individual written responses we held group discussions of those questions. The results of this process, which we summarized in reports to the panelists following these meetings constitute a strong pattern of support for the reasonableness of the RBRVS within the specialties. Panelists generally held that the rank order, range, and proportional ratios of the survey ratings accorded with their clinical experience. They judged the ratings of intra-service work and its dimensions to be generally appropriate, but questioned some values for time, particularly some of our extrapolated values for pre- and post-service time (Dunn, Hsiao, Ketcham, Braun, 1988). They generally expressed the view that the global ratings of work, rather than estimates of time or ratings of other dimensions, were the measures that

best reflected clinical reality. Panelists generally thought that the RBRVS reflected relative work within their specialties better than the alternative scales.

In the afternoon sessions, we presented our proposed methods on the extrapolation process and then had specialties focus on some representative examples of the extrapolation processes as applied to their specialty. We also discussed alternative approaches for combining the components of the RBRVS.

A sample agenda of these meetings is presented in Table 6. Summaries of the issues and discussions at the meetings are reported in Appendix D. Readers are strongly urged to review these detailed appendices to get a fuller sense of the detail and discussions that took place at the meeting.

3.4.2 Cross Specialty Consultative Panel

To address issues and questions that related directly to our cross-specialty linkage process, we formed a cross-specialty consultative panel.

3.4.2.1 Functions

The cross-specialty consultative panel had several related purposes:

- Advising on matters related to the identification of services to be used in cross-specialty comparisons and on establishing cross-specialty comparisons;
- Critiquing the cross-specialty methodology; and

- Assessing the reasonableness and validity of cross-specialty RBRVS results.

3.4.2.2 Membership

There were 34 physicians on the cross-specialty consultative panel. A listing of cross-specialty panelists and their specialty is attached in Table 7.

At least one TCG panelist was selected from each specialty to serve on the cross-specialty panel. In some specialties, additional members were added because these specialties were cross-linked with many specialties and our process required more than one physician. We also included two physicians from Boston health maintenance organizations because, we felt, their work environment and experience would add a useful perspective on cross-specialty linkages.

3.4.2.3 Process and Agendas

Three cross-specialty panel meetings were held. In the following section, we summarize the activities at these cross-specialty panel meetings.

First Cross-Specialty Panel Meeting

The first meeting took place in December of 1986. The primary purpose of the meeting was to further develop lists of surveyed services that were the "same" or "equivalent" across

specialties and which could be used in our cross-specialty methodology.

We began the meeting by reviewing alternative approaches for establishing cross-specialty comparisons and inviting panelist to reflect on other approaches. These alternative approaches would then be discussed later in the day. We then presented our approach for cross-specialty comparison for discussion and responded to panelists' questions and comments. Lists of services were developed among the participating specialties that represented the same or equivalent services. These services are discussed in detail in Chapter 6. The final session at the meeting again reviewed other alternative approaches and considered panelists suggestions.

The agenda for the meeting is presented in Table 8. It should be noted that the lists of services developed at this meeting were developed prior to the review of any data or discussions about the results of our national survey. Appendix E summarizes in greater detail the activities and issues at the first cross-specialty panel meeting.

Second Cross-Specialty Panel Meeting

The second meeting of the cross specialty panel took place in December of 1987. The meeting was designed to achieve several purposes. On the first day of the meeting, as shown in the agenda in Table 9, we began by reviewing the cross-specialty links developed at the first meeting. We provided panelists with

mean times from the national survey for each set of links and asked panelists about any discrepancies beyond 20 percent. Panelists were asked which links are still valid and which ones should be dropped. In later sessions, the panelists spent most of their time selecting and discussing potential cross-specialty links in order to agree on a larger number of links for the cross-specialty comparison.

On the second day of the cross-specialty meeting, we reviewed the methodology for the cross-specialty linkage process and discussed our treatment of pre- and post- time. We next presented and discussed the methodology used for aligning the pairs of cross-specialty links. Problems resulting from weak or poor links were raised and discussed. Finally, we presented for critical analysis preliminary cross-linked RBRVs for some selected services using the old cross-specialty links from the December 1986 meeting. Some of the policy implications of the results were reviewed and the monetary conversion factor was discussed. A more detailed presentation of the activities at the meeting is presented in Appendix F.

Figure 1. A Diagram Relating the Patient's Condition and Work Input Required for Physician Services

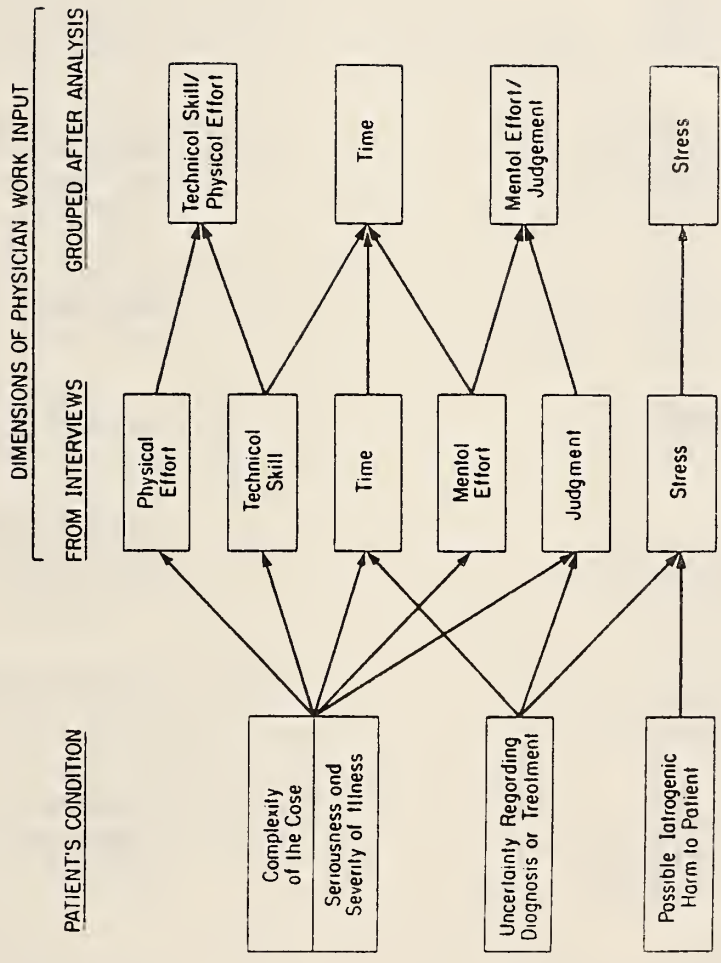


Table 1

List of RBRVS technical consulting panel members

Allergy & Immunology

Bernard Booth, M.D.

Roger Katz, M.D.

John Selner, M.D.

Albert Sheffer, M.D.

Jackson, MI

Los Angeles, CA

Denver, CO

Boston, MA

Otolaryngic Allergy

Donald Nalebuff, D.M.D., M.D.

Teaneck, NJ

Anesthesiology

H. Ketcham Morrell, M.D.

Jess B. Weiss, M.D.

James F. Arens, M.D.

Ronald MacKenzie, D.O.

Marcellus, NY

Boston, MA

Galveston, TX

Rochester, MN

Cardiology

T. Joseph Reeves, M.D.

John A. Spittell, M.D.

Beaumont, TX

Rochester, MN

Colon/Rectal Surgery

Eugene Salvati, M.D.

Plainfield, NJ

Dermatology

Fred Castrow, M.D.

Lenore Kakita, M.D.

John Strauss, M.D.

Houston, TX

Glendale, CA

Iowa City, IA

Emergency Medicine

Robert Anzinger, M.D.

Elliott Cohen, M.D.

River Forest, IL

Beverly, MA

Family Practice

Ernie Chaney, M.D.

Philip Cleveland, M.D.

James Jones, M.D.

Wichita, KS

Spokane, WA

Greenville, NC

Gastroenterology

Willis Maddrey, M.D.

Bergein Overholt, M.D.

Philadelphia, PA

Knoxville, TN

General Surgery

Robert Bartlett, M.D.

Alfred Clementi, M.D.

W. K. Fitzpatrick, M.D.

James Weber, M.D.

Ann Arbor, MI

Arlington Hts. IL

Salt Lake City, UT

Jacksonville, AR

Table 1 continued

List of RBRVS technical consulting panel members

Hematology/Oncology

Martin Liebling, M.D.

Michael Perry, M.D.

Marcus Shook, M.D.

Miami, FL

Columbia, MO

Oklahoma City, OK

Internal Medicine

William Felch, M.D.

Eugene Ogrod II, M.D.

D.J. Sandford Schwartz, M.D.

Earl Steinberg, M.D.

Rye, NY

Sacramento, CA

Philadelphia, PA

Baltimore, MD

Nephrology

Donald A. Adams, M.D.

Jordan J. Cohen, M.D.

Los Angeles, CA

Chicago, IL

Neurology

William Kennedy, M.D.

Nelson Richards, M.D.

Minneapolis, MN

Charlottesville, VA

Neurosurgery

Merwin Bagan, M.D.

Paul Croissant, M.D.

Phillip Lippe, M.D.

Concord, NH

Bloomfield Hills, MI

San Jose, CA

Nuclear Medicine

Philip Alderson, M.D.

Larry Heck, M.D.

Oscar Powell, M.D.

New York, NY

Indianapolis, IN

Pittsburgh, PA

Obstetrics and Gynecology

Robert Cefalo, M.D.

William H. Coleman, M.D.

Richard Gallagher, M.D.

Larry Griffin, M.D.

Alan Lasnover, M.D.

Stanley Marinoff, M.D.

Chapel Hill, NC

Scottsboro, AL

Concord, MA

Louisville, KY

Cupertino, CA

Washington, DC

Ophthalmology

Elliott Blaydes, M.D.

Wayne Fung, M.D.

George Garcia, M.D.

Stephen Obstbaum, M.D.

Bluefield, WV

San Francisco, CA

Boston, MA

New York, NY

Table 1 continued

List of RBRVS technical consulting panel members

Oral and Maxillofacial Surgery

John Helfrick, D.D.S., M.S.
Robert Lauer, D.D.S.
Lanny Garvar, D.M.D.
James Timmons, D.M.D.
Steven Roser, D.M.D., M.D.

Houston, TX
Worthington, OH
Tamarac, FL
Malden, MA
New York, NY

Orthopedic Surgery

Rufus F. Stanley, Jr., M.D.
Clement B. Sledge, M.D.
Blair C. Filler, M.D.

Houston, TX
Marblehead, MA
Inglewood, CA

Otolaryngology

Charles Koopman, M.D.
Russell Kridel, M.D.
William Lavelle, M.D.
Wallace Rubin, M.D.

Ann Arbor, MI
Houston, TX
Everett, MA
Materie, LA

Pathology

Fred Gorstein, M.D.
Pierre W. Keitges, M.D.
Sheldon F. Markel, M.D.
John C. Neff, M.D.
Paul A. Raslavicus, M.D.

Nashville, TN
Kansas City, MO
Ann Arbor, MI
Columbus, OH
Lynnfield, MA

Pediatrics

Leonard A. Kutnik, M.D.
Anthony T. Hirsch, M.D.
R. Don Blim, M.D.
George A. Little, M.D.
Elizabeth R. McAnarney, M.D.

San Diego, CA
Los Angeles, CA
Kansas City, MO
Hanover, NH
Rochester, NY

Physical Medicine

Bruce M. Gans, M.D.
Edwin G. Gonzalez, M.D.

Boston, MA
New York, NY

Plastic Surgery

James May, Jr., M.D.

Boston, MA

Preventive Medicine

Charles Berry, Sr., M.D.

Houston, TX

Table 1 continued

List of RBRVS technical consulting panel members

Psychiatry

Boris Astrachan, M.D.	New Haven, CT
William Ayres, M.D.	San Mateo, CA
Lee Beecher, M.D.	St. Louis Park, MN
Carol Nadelson, M.D.	Brookline, MA
Ronald Shellow, M.D.	Miami, FL

Pulmonary Disease

Alan L. Plummer, M.D.	Atlanta, GA
Steven M. Zimmet, M.D.	Arlington, VA

Radiology

Franklin Angell, M.D.	Baltimore, MD
Carl Bogardus, M.D.	Oklahoma City, OK
Barbara Chick, M.D.	Glen Falls, NY
Kenneth Kidd, M.D.	Santa Barbara, CA
Robert Songe, M.D.	Dearborn, MI

Rheumatology

Arthur Weaver, M.D.	Lincoln, NB
Matthew Liang, M.D.	West Newton, MA

Thoracic/Cardiovascular Surgery

John E. Albers, M.D.	Cincinnati, OH
Marvin M. Kirsh, M.D.	Ann Arbor, MI
Benson B. Roe, M.D.	San Francisco, CA

Urology

Alan H. Bennett, M.D.	Albany, NY
Robert Wickham, M.D.	New York, NY
Wallace A. Gerrie, M.D.	Newport Beach, CA

Table 2

Chronology of events for the national study of
resource-based relative value scales for physician services

<u>Date</u>	<u>Event</u>
1986 June - July	First technical consultant group meeting
September	Pre-test pilot survey instrument
October - December	Pilot survey
December	First cross-specialty panel meeting
1987 February - March	Pre-tests national survey instrument
March - June	National survey
June	Advisory panel meeting
June - July	Second technical consultant group meeting
October - November	Pre- and post-time resurvey
December	Second cross-specialty panel meeting
1988 January	Advisory committee meeting
February	Third cross-specialty panel meeting
March	National consultative conference
September	Physician Evaluation Committee meetings

Table 3

Sample agenda:
first technical consulting panel meeting

Wednesday, June 25, 1986

Colonnade Hotel
6:00 p.m. - 10:00 p.m.

120 Huntington Avenue
Boston, Massachusetts

Working Session #1:

6:00 - 6:30 p.m.

Drinks and Hors d'oeuvres

6:30 - 7:30 p.m.

Dinner

7:30 - 10:00 p.m.

Presentations and Discussions

Introductions

Conceptual Issues Related to the Study

Boundaries of Study

Scope of Panel Meetings

Thursday, June 26, 1986

Harvard School of Public Health

677 Huntington Avenue
Boston, Massachusetts

Working Session #2:

Rooms 202, 203

9:00 a.m. - 12:00 a.m.

Selecting the services and procedures which
best characterize the specialty.

Frequent Services/Procedures and Problems

Evaluation/Management, Invasive, Laboratory,
Imaging

Important Emerging Procedures

Cross-Specialty Procedures and Problems

12:00 a.m. - 1:15 p.m.

Room 110

Lunch

1:30 p.m. - 2:30 p.m. (Combined Session)

Room 202

Working Session #3:

Methological Issues

Measuring Intensity

2:45 - 4:00 p.m. (Combined Session)

Room 202

Working Session #4:

Cross-Specialty Discussion

Problems and Issues, wrap-up discussion

Summary and Conclusions

Table 4

Number of services surveyed for each specialty¹

Allergy/Immunology	19
Anesthesiology	23
Dermatology	22
Family Practice	26
General Surgery	26
Internal Medicine	25
Oral and Maxillofacial Surgery	24
Obstetrics and Gynecology	27
Ophthalmology	22
Orthopedics	22
Otolaryngology	22
Pathology	19
Pediatrics	22
Psychiatry	25
Radiology	22
Rheumatology	19
Thoracic/Cardiovascular Surgery	22
Urology	22
Total	409

¹ Includes the reference service for the specialty.

Table 5

List of surveyed services and procedures used
in the national survey, by specialty

Allergy/Immunology		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Follow-up office visit for pharmacological management of 30 year old female with hay fever.
95017	A.	Intracutaneous, intradermal, tests with stinging insects, immediate reaction (15-20 minutes) 11-15 tests.
90060	B.	Office visit, established patient, 6 year old child with sore throat and headache.
95000	C.	Percutaneous tests with allergenic extracts (First 30 tests).
95020	D.	Intradermal tests with allergenic extracts (First 10 tests).
90220	E.	Direct hospital admission for care of young adult patient, who has failed previous therapy and now presents in acute asthmatic attack.
90020	F.	Initial office visit for evaluation of child with chronic wheezing.
95135	G.	Single injection for immunotherapy, antigen supplied by another source.
94010-26	H.	Interpretation of pulmonary function tests and interpretation of results, FVC (forced vital capacity), FEV (forced expiratory volume), FEF (forced expiratory flow).
92511	I.	Fibrosopic exam of nasal, choanal, pharynx for nasal polyps.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Allergy/Immunology	
<u>CPT Code</u>	<u>Service/Procedure</u>
95070	J. Inhalation bronchial challenge testing with histamine, methacholine, or similar compound; not including necessary pulmonary function tests.
95150	K. Professional services for supervision and provision of antigens for allergen immunotherapy.
90020	L. Evaluation of 6 year old male with multiple infections, new patient.
86455	M. Application and reading of intradermal tests with antigens for immune deficiency evaluation.
90020	N. Initial office evaluation of adult with chronic recurrent hives, new patient.
90070	O. Office visit with 45 year old male, established patient, with chronic asthma, on chronic steroid and bronchodilator therapy.
99156	P. Medical conference by physician regarding medical management with patient and/or family; counseling for avoidance, elimination, symptomatic treatment, and immunotherapy.
80500	Q. Interpretation of serum immunoelectrophoresis.
90220	R. Direct hospital admission of 62 year old smoker, established patient, with bronchitis, in acute respiratory distress.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Anesthesiology

<u>CPT Code</u>		<u>Service/Procedure</u>
00830	Std.	Anesthesia for inguinal hernia repair.
00562	A.	Anesthesia for coronary artery bypass graft with pump oxygenator.
00910	B.	Anesthesia for cystoscopy.
00840	C.	Anesthesia for colectomy.
01270	D.	Anesthesia for femoral-popliteal bypass.
00806	E.	Anesthesia for laparoscopic tubal ligation.
00790	F.	Anesthesia for cholecystectomy.
01214	G.	Anesthesia for total hip replacement.
93503	H.	Insertion of Swan Ganz catheter.
01382	I.	Anesthesia for knee arthroscopy.
01210	J.	Anesthesia for open reduction and internal fixation of hip fracture.
00770	K.	Anesthesia for repair of abdominal aortic aneurysm.
00940	L.	Anesthesia for dilation and curettage of uterus.
00142	M.	Anesthesia for lens surgery, cataract extraction with or without insertion of prosthesis.

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Table 5 continued

Anesthesiology	
<u>CPT Code</u>	<u>Service/Procedure</u>
90630	N. Evaluation of 63 year old patient in intensive care unit with diabetes and chronic renal failure who develops Adult Respiratory Distress Syndrome 36 hours post mitral valve replacement.
00914	O. Anesthesia for transurethral resection of prostate.
00350	P. Anesthesia for carotid endarterectomy.
01710	Q. Regional intravenous anesthesia for upper extremity operation.
62278	R. Injection of anesthetic substance, therapeutic, epidural, single, epidural block for pain.
00404	S. Anesthesia for modified radical mastectomy.
00210	T. Anesthesia for craniectomy or craniotomy.
00850	U. Anesthesia for cesarean section.
90620	V. Consultation for a transfusion reaction in a patient with abrupt onset of fever and back pain.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Dermatology		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Follow-up visit with 48 year old male for ongoing management of psoriasis not PUVA (psoralen, ultraviolet A) treatment.
11401	A.	Excision of changing pigmented lesion of back, 6x4 millimeters, 52 year old male.
17000	B.	Cryodestruction of multiple, 3 to 4, facial actinic keratoses in a 65 year old farmer.
17001		
17001		
17002		
90017	C.	Initial office visit, for evaluation and counseling of 17 year old female with primary genital herpes.
87207	D.	Obtain specimen for Tzanck Smear and interpretation of test.
90017	E.	Initial office visit, 35 year old male with complaint of alopecia.
11900	F.	Intralesional injection, triamcinolone.
90050	G.	Office revisit for evaluation of 28 year old male with onychomycosis.
87220	H.	Obtain specimen for KOH slide and interpretation of test.
17999	I.	Office revisit with established 63 year old patient for laser treatment of hemangioma.
90017	J.	Initial office visit, 16 year old male with severe cystic acne, new patient.
96912	K.	Photochemotherapy (PUVA-psoralen, ultraviolet A), scheduled treatment during course of therapy.
11100	L.	Shave/punch biopsy of probable skin cancer.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Dermatology	
<u>CPT Code</u>	<u>Service/Procedure</u>
11642	M. Curettage & electrodesiccation of 10 by 12 millimeter basal cell epithelioma (BCE) of cheek of 60 year old male.
11641 12051	N. Excision & intermediate repair of 4 by 6 millimeter BCE (basal cell epithelioma) of forehead of 30 year old female.
17100 17101 17102	O. Liquid nitrogen cryodestruction of 3 verrucae of hands of 14 year old male.
90620	P. Hospital consultation for possible drug eruption in 50 year old male.
77400	Q. X-ray therapy, BCE (basal cell epithelioma) of tip of nose of 65 year old female, single treatment, not entire course.
90020	R. Initial office evaluation of adult with chronic recurrent hives, new patient.
88305	S. Pathologic gross and microscopic examination of a changing melanocytic lesion in a 26 year old woman.
90020	T. Initial comprehensive evaluation of 30 year old woman with symptoms of subacute cutaneous LE (lupus erythematosus).
11441 11440	U. Excision of 2 facial nevi in 20 year old male, 8 and 4 millimeters respectively.

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Table 5 continued

Internal Medicine		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Follow-up visit of a 55 office visit male for management of hypertension, mild fatigue, on beta blocker/thiazide regimen.
90570	A.	Management of patient in acute pulmonary edema in emergency room, who subsequently is admitted to hospital, established patient.
90050	B.	Office visit, sore throat, fever, and fatigue in 19 year old college student, established patient.
20610	C.	Aspiration of synovial fluid from knee.
45300	D.	Rigid sigmoidoscopy, without biopsy, in office.
81000	E.	Urinalysis with microscopic exam in office lab under your supervision, excluding collection.
90017	F.	Initial office evaluation for diagnosis and management of painless gross hematuria in new patient, without cystoscopy.
90630	G.	Emergency hospital consultation, 72 year old, new patient, with possible bowel obstruction.
90050	H.	Office evaluation for possible purulent bacterial conjunctivitis with 1-2 day history of redness and discharge in 16 year old female, established patient.
90060	I.	Office visit with 45 year old male, established patient with chronic asthma, on chronic steroid and bronchodilator therapy.
90070	J.	Office evaluation of new onset right lower quadrant pain in a 32 year old woman, established patient.

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Table 5 continued

Internal Medicine	
<u>CPT Code</u>	<u>Service/Procedure</u>
90080	K. Office visit for detailed evaluation of recent onset syncopal attacks in 70 year old woman, established patient.
90070	L. Office evaluation of 28 year old patient with regional enteritis, diarrhea, and low grade fever, established patient.
90220	M. Direct hospital admission of a 62 year old smoker, established patient, with bronchitis in acute respiratory distress.
90260	N. Follow-up hospital visit, day 2, patient with non-dominant CVA (cerebral vascular accident) with mild hemiparesis.
90260	O. Hospital visit, day 3 post admission, 65 year old male with uncomplicated MI (myocardial infarction), established patient.
90350	P. Scheduled monthly nursing home visit to established patient with Organic Brain Syndrome.
90370	Q. Nursing home visit, unscheduled, for evaluation of patient with fever and obtundation that subsequently does not involve hospital admission.
90610	R. Hospital consultation for diagnosis/management of fever following abdominal surgery.
90017	S. Initial evaluation and management of recurrent urinary infection in female.
90750	T. Initial office evaluation of a 37 year old generally well male.
93000	U. ECG (electrocardiogram) with interpretation in a 50 year old man.

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Table 5 continued

Internal Medicine		
<u>CPT Code</u>		<u>Service/Procedure</u>
99014	V.	Office phone consultation regarding possible adverse drug reaction in established patient.
99015	W.	Phone consultation from patient at home, 1:30 A.M., regarding new onset of belching, abdominal pain, and nausea in 62 year old man.
99155	X.	One supervisory conference with visiting nurse for antibiotic therapy in established patient with subacute bacterial endocarditis.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Family Practice		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Follow-up visit with 55 year old a male for management of hypertension, mild fatigue, on beta blocker/thiazide regimen.
90220	A.	Direct hospital admission for care of young adult established patient, who has failed previous therapy and now presents in acute asthmatic attack.
90050	B.	Office revisit for evaluation of 28 year old male with onychomycosis.
12002	C.	Repair of 2 inch laceration of scalp, 14 year old male, office setting.
44950	D.	Appendectomy for acute abdomen with unperforated appendicitis.
45300	E.	Rigid sigmoidoscopy, without biopsy, in office.
46050	F.	Incision and drainage of peri-anal abscess, office procedure.
58150	G.	Abdominal hysterectomy for cancer in situ of cervix in 50 year old woman.
59410	H.	Uncomplicated spontaneous vaginal delivery.
81000	I.	Urinalysis with microscopic exam in office lab under your supervision, excluding collection.
87220	J.	Obtain specimen for KOH (potassium hydroxide) slide and interpretation of test.
90020	K.	Initial visit for pregnancy in 25 year old primigravida, new patient, including complete history and physical examination, record preparation, risk assessment, routine prenatal laboratory evaluation, education and counseling, vitamin prescription.

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Table 5 continued

Family Practice

<u>CPT Code</u>	<u>Service/Procedure</u>
90050	L. Office visit, established patient, 6 year old child with sore throat and headache.
90050	M. Office evaluation for possible purulent conjunctivitis with 1-2 day history of redness and discharge in 16 year old female, established patient.
90060	N. Routine periodic gynecologic exam, by primary care physician, 24 year old established patient, without complaints.
90060	O. Office visit with 45 year old male, established patient, with chronic asthma, on chronic steroid and bronchodilator therapy.
90070	P. Office evaluation of new onset right lower quadrant pain in 32 year old woman, established patient.
90070	Q. Office evaluation of 28 year old patient with regional enteritis, diarrhea and low grade fever, established patient.
90350	R. Scheduled monthly nursing home visit to established patient with Organic Brain Syndrome.
90370	S. Nursing home visit, unscheduled, for evaluation of patient with fever and obtundation, that subsequently does not involve hospital admission.
90570	T. Management of patient in acute pulmonary edema in emergency room, who is subsequently admitted to hospital, established patient.

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Table 5 continued

Family Practice	
<u>CPT Code</u>	<u>Service/Procedure</u>
90620	U. Office consultation for psychiatric examination of 25 year old male with intellectual deterioration and behavior problems, including verbal and physical abuse of co-workers.
90630	V. Emergency hospital consultation, 72 year old, new patient, with possible bowel obstruction.
90764	W. Comprehensive well child visit at 6 months, established patient (AAP - American Academy of Pediatrics - guidelines).
99015	X. Phone consultation from patient at home, 1:30 A.M., regarding belching, abdominal pain and nausea in a 62 year old male.
99155	Y. One supervisory conference with visiting nurse for antibiotic therapy in established patient with subacute bacterial endocarditis.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

General Surgery		
<u>CPT Code</u>		<u>Service/Procedure</u>
49505	Std.	Uncomplicated indirect inguinal hernia repair, 45 year old male.
43110	A.	Total esophagectomy with gastroesophageal anastomosis in chest.
32020	B.	Chest tube insertion for spontaneous pneumothorax, in 20 year old.
01710	C.	Regional intravenous anesthesia for upper extremity operation; surgery to be done by other than yourself.
19240	D.	Modified radical mastectomy.
31603	E.	Tracheostomy, emergency procedure, transtracheal, in adult, for partial airway obstruction, post trauma.
42820	F.	Tonsillectomy and adenoidectomy in 10 year old child.
44145	G.	Low anterior resection for rectal carcinoma.
44950	H.	Appendectomy for acute abdomen with unperforated appendicitis.
45300	I.	Rigid sigmoidoscopy, without biopsy, in office.
45385	J.	Colonoscopy and polypectomy in 53 year old male with 2 colon polyps, outpatient procedure.
47600	K.	Cholecystectomy for cholelithiasis.
58150	L.	Abdominal hysterectomy for cancer in situ of cervix in 50 year old woman.

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Table 5 continued

General Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
64721	M. Decompression of carpal tunnel in 48 year old female, unilateral, ambulatory surgery unit.
67840	N. Excision of 0.5 cm basal cell carcinoma on the outer 1/3 of the lower eyelid.
90020	O. Preoperative evaluation of new patient with primary hyperparathyroidism.
90020	P. Comprehensive office visit for initial evaluation of a 48 year old male with recurrent low back pain radiating to the leg.
90050	Q. Follow-up office visit, 60 year old established patient 8 weeks post partial colectomy with end-to-end anastomosis.
90060	R. Follow-up visit, post treatment, of patient with primary breast cancer.
90070	S. Office evaluation of new onset right lower quadrant pain in a 32 year old woman, established patient.
90220	T. Hospital admission, 45 year old female with acute cholecystitis.
90250	U. Hospital visit, 3 days post uncomplicated cholecystectomy with common bile duct exploration.
90630	V. Initial evaluation and formulation of plan for management of multiple trauma patient with complex pelvic fracture in 35 year old male.
90630	W. Emergency hospital consultation, 72 year old, new patient, with possible bowel obstruction.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

General Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
93503	X. Insertion of Swan-Ganz catheter.
99160 99162	Y. Triage, resuscitation and hospital admission from ER (emergency room), prior to consultation/intervention, of 52 year old, new patient, alcoholic male with ascites, jaundice, encephalopathy, and massive hematemesis.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Obstetrics and Gynecology		
<u>CPT Code</u>		<u>Service/Procedure</u>
58120	Std.	Diagnostic dilatation and curettage for menometrorrhagia in 50 year old female.
90017	A.	Initial office evaluation of secondary amenorrhea, in 22 year old new patient, pregnancy excluded.
90050	B.	Limited prenatal follow-up visit, no unusual complaints; interval history and examination, partial urinalysis, brief counseling.
90020	C.	Initial visit for pregnancy in 25 year old primigravida, new patient, including history and physical, record preparation, risk assessment, routine prenatal laboratory evaluation, education and counseling, vitamin prescription.
90060	D.	Extended follow-up prenatal visit at 36-37 weeks with diagnosis and management of ongoing complaints, examination including assessment of cervical change; extensive counseling regarding events requiring prompt physician contact; partial urinalysis.
	E.	Normal uncomplicated labor, multipara, no prenatal risk factors, only time spent with the patient.
	F.	Labor complicated by moderate hypertension, primigravida, only time spent with patient.
	G.	Preterm labor at 32 weeks requiring tocolysis, otherwise healthy patient, only time spent with patient.

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Table 5 continued

Obstetrics and Gynecology	
<u>CPT Code</u>	<u>Service/Procedure</u>
	H. Protracted labor requiring pitocin augmentation and electronic monitoring, primigravida, only time spent with the patient.
58925	I. Ovarian cystectomy, unilateral, uncomplicated, in 25 year old.
58150	J. Abdominal hysterectomy for cancer in situ of cervix in 50 year old.
90060	K. Routine periodic gynecologic examination by primary care physician, established patient, without complaints.
90070	L. Office evaluation of new onset right lower quadrant pain in 32 year old woman, established patient.
59410	M. Uncomplicated spontaneous vaginal delivery.
57454	N. Colposcopy for abnormal cervical cytology, Pap smear, with biopsy of the cervix.
58982	O. Laparoscopic tubal sterilization by fulguration in 35 year old.
90050	P. Office visit for postpartum care 6 weeks after an uncomplicated spontaneous vaginal delivery.
59500	Q. Uncomplicated cesarean delivery for cephalopelvic disproportion.
76805	R. Fetal ultrasound for possibility of fetal abnormality, real time B-scan with image documentation.
59000	S. Performance of amniocentesis at 16 weeks gestation.

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Table 5 continued

Obstetrics and Gynecology	
<u>CPT Code</u>	<u>Service/Procedure</u>
59025-26	T. Interpretation of fetal non stress test.
90017	U. Initial office visit for evaluation and counseling of a 17 year old female with primary genital herpes.
58265	V. Vaginal hysterectomy, anterior and posterior colporrhaphy.
59840	W. Elective termination of first trimester pregnancy by uterine evacuation and curettage.
90020	X. Initial office visit of 34 year patient with primary infertility, including counseling.
77763	Y. Intracavitary radioelement application in patient with cervical cancer, not including preparation of radioelement or post insertion dosimetry calculations.
90070	Z. Office visit for counseling with a 25 year old primigravida with family history of Downs Syndrome.

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Table 5 continued

Ophthalmology		
<u>CPT Code</u>		<u>Service/Procedure</u>
67800	Std.	Single chalazion procedure, excision, left upper lid.
65740 66984	A.	Penetrating keratoplasty, cataract extraction and intraocular lens implantation, combined procedure.
92012	B.	Follow-up exam, established patient, including visual acuity, slit lamp, tonometry, brief fundus exam.
92004	C.	Comprehensive eye exam, adult patient with no specific complaints, including history taking, vision test with Snellen Chart, refraction, motility testing, external exam, tonometry, slit lamp exam, fundus exam, confrontation fields.
90630	D.	Consultation/extensive evaluation for a complex ophthalmic problem, including all services listed in comprehensive eye exam, plus the following: dilated fundus exam, gonioscopy, visual fields testing.
66985	E.	Secondary lens implant, without vitrectomy.
92082-26	F.	Interpretation of formal visual fields testing for neurological purposes in adult patient.
76516	G.	IOL calculation, biometry/keratometry, A-mode.
76512	H.	Diagnostic ultrasonography of eye ball with interpretation, B-Mode, for possible retinal detachment.
15822-50	I.	Lid surgery, two-lid blepharoplasty, both upper lids.

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Table 5 continued

Ophthalmology

<u>CPT Code</u>	<u>Service/Procedure</u>
66984	J. Extracapsular cataract extraction with IOL.
67312	K. Commitant strabismus surgery, primary, 2 muscles total, one or both eyes, in a child.
65850	L. Glaucoma filtering procedure, primary, trabeculotomy.
67107	M. Scleral buckle, without vitrectomy, primary.
67228	N. Panretinal photocoagulation, total treatment, one eye, single or divided sessions.
92004 92310	O. Contact lens evaluation and fitting, including all services in comprehensive eye exam, plus: keratometry, Schirmer's test, trial lens fitting, and overrefraction.
92250-26	P. Interpretation of fundus photography.
92235	Q. Fluorescein angiography for diabetic retinopathy, injection of dye and interpretation, one eye.
92286	R. Endothelial cell count pre-operative for cataract surgery.
90050	S. Office evaluation for possible purulent bacterial conjunctivitis with 1-2 day history of redness and discharge in 16 year old female, established patient.
66999	T. Refractive surgery, radial keratotomy.
67840	U. Excision of 0.5 cm basal cell carcinoma on the outer 1/3 of the lower eyelid.

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Table 5 continued

Oral and Maxillofacial Surgery		
<u>CPT Code</u>		<u>Service/Procedure</u>
D7281	Std.	Exposure of single impacted cuspid in office for 14 year old for future orthodontic treatment, no traction device required.
21250 21200	A.	LeFort one maxillary and sagittal split mandibular osteotomies for correction of developmental deformity in 28 year old female.
90015	B.	Office visit to advise for or against removal of wisdom teeth, 18 year old male referred by orthodontist.
D7240	C.	Removal of 4 impacted (full bony) wisdom teeth, single office procedure, 21 year old male college student.
D7240	D.	Removal of 4 impacted (full bony) wisdom teeth, single hospital procedure, 21 year old male college student.
00170 D9220	E.	General anesthesia for 14 year old child for exposure of single impacted cuspid, office setting.
00170 D9220	F.	General anesthesia for extraction of abscessed tooth in a healthy 40 year old male.
D7110 D7120 D7120 D7120 D7120 D7120 D7120 D7120 D7120	G.	Extraction of 10 erupted mandibular teeth, 60 year old male on Persantine and aspirin, 6 years post MI (myocardial infarction).

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Table 5 continued

Oral and Maxillofacial Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
D7110	H. Extraction of abscessed tooth in a healthy 40 year old male.
21200	I. Bilateral sagittal osteotomy, mandibular ramus in 20 year old female for developmental deformity.
11440	J. Excision of .5 cm benign lesion of the lip in a 60 year old female.
90020	K. Comprehensive evaluation of 28 year old female with 2 year history of facial/TMJ (temperomandibular joint) pain and joint clicking.
90015	L. Office visit for 45 year old female smoker with small oral ulcer on the lateral border of tongue.
00170 D9220	M. General anesthesia in office for extraction of 4 wisdom teeth in healthy 18 year old male, surgery performed by other than yourself.
00170 D9220	N. General anesthesia for extraction of fractured tooth in 4 year old child.
31032	O. Unilateral Caldwell-Luc procedure for maxillary sinus disease, with antral polyp removal.
21455	P. Closed reduction of mandibular fracture by manipulation and intermaxillary fixation, 24 year old male.
21470	Q. Open surgical treatment, complex mandibular fracture, internal fixation, interdental fixation, and/or wiring of dentures or splints; 32 year old female.

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Table 5 continued

Oral and Maxillofacial Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
70355	R. Interpretation of panoramic x-rays for recommendation for removal of impacted wisdom teeth, 18 year old male referred by orthodontist.
70330	S. Performance and interpretation of bilateral x-ray of TMJ (temperomandibular joint), open and closed mouth, 31 year old female.
21365	T. Open treatment, multiple fractures of zygomatic arch and malar tripod, with internal skeletal and multiple surgical approaches.
29909	U. Unilateral arthroscopy of TMJ (temperomandibular joint).
D05974	V. Placement of 4 maxillary endosseous implants.
21240	W. Unilateral meniscoplasty, temporomandibular joint.

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Table 5 continued

Orthopedic Surgery		
<u>CPT Code</u>		<u>Service/Procedure</u>
64721	Std.	Decompression of carpal tunnel in 48 year old female, unilateral, ambulatory surgery unit.
27130	A.	Primary total hip replacement for osteoarthritis.
90250	B.	Day 3 or 4 post-op follow-up of 80 year old female with repair of intertrochanteric fracture.
28292	C.	Bunionectomy, Keller/McBride/Mayo type, 45 year old female, ambulatory surgery unit.
29881	D.	Arthroscopic partial meniscectomy, 22 year old male with knee trauma, ambulatory surgery unit.
63030	E.	Unilateral lumbar laminectomy with excision of intervertebral disc, single level, without fusion.
27244	F.	Open reduction and internal fixation of intertrochanteric fracture in 80 year old female.
25611	G.	Reduction of unstable closed comminuted fracture of distal radius, external fixation with metallic type device, ambulatory surgery unit.
90020	H.	Comprehensive initial office visit for evaluation of 13 year old female with progressive scoliosis.
90020	I.	Comprehensive office visit for initial evaluation of 48 year old man with recurrent low back pain radiating to the leg.
90630	J.	Initial evaluation and plan for management of multiple trauma patient with complex pelvic fracture in 35 year old male.

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Table 5 continued

Orthopedic Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
90060	K. Intermediate office visit, established patient with known osteoarthritis and painful swollen knees.
72110-26	L. Interpretation of lumbar spine X-rays, complete radiograph exam, adult patient with low back pain.
24640	M. Closed reduction of a subluxation of head of the radius at the elbow in a 4 year old male, office setting.
90017	N. First visit for evaluation and counseling of 28 year old male runner with knee and calf pain.
73110-26	O. Interpretation x-rays in treatment of comminuted fracture of distal radius, 3 initial views, 2 immediate post-reduction views.
73080-26	P. Interpretation of elbow x-rays: complete radiograph exam, for pain, tenderness.
73630-26	Q. Interpretation of foot x-rays for possible fracture, complete radiograph exam for severe mid foot pain.
20610	R. Aspiration of synovial fluid from knee, office procedure.
72266	S. Performing and interpreting lumbar myelogram, 68 year old female.
63017	T. Laminectomy for decompression of spinal cord and/or cauda equina, more than two segments; lumbar.
73510-26	U. Interpretation of hip x-rays, complete, for moderate/severe hip pain.

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Table 5 continued

Otolaryngology		
<u>CPT Code</u>		<u>Service/Procedure</u>
42820	Std.	Tonsillectomy and adenoidectomy in 10 year old child.
31365	A.	Laryngectomy, with radical neck dissection for cancer in 65 year old male.
90050	B.	Office visit, sore throat, fever, and fatigue in 19 year old college student, established patient.
90017	C.	Initial office evaluation for gradual hearing loss in 58 year old male, history and physical, evaluation with interpretation of complete audiogram, air bone conduction reflexes, speech reception thresholds and discrimination.
69437	D.	Bilateral tympanostomy with tube insertion for recurrent otitis in 2 year old, general anesthesia.
31621	E.	Diagnostic fiberoptic bronchoscopy in patient with suspected bronchopulmonary lesion.
30420	F.	Septorhinoplasty, primary rhinoplasty with major septal repair, in 25 year old male.
31535	G.	Direct laryngoscopy with biopsy for suspected carcinoma in 50 year old male, general anesthesia.
69641	H.	Tympanoplasty with mastoidectomy for cholesteatoma in adult.
90020	I.	Evaluation of recurrent dizziness and vertigo in 48 year old female, including history and physical, new patient, lab tests not included.
92557	J.	Interpretation of audiometry, basic, comprehensive.

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Table 5 continued

Otolaryngology		
<u>CPT Code</u>		<u>Service/Procedure</u>
92541	K.	Interpretation of spontaneous nystagmus test, with recording (ENG - electronystagmography).
42415	L.	Parotidectomy, lateral lobe, with dissection and preservation of facial nerve, for parotid tumor in adult patient.
31603	M.	Tracheostomy, emergency procedure, transtracheal, in adult, for partial airway obstruction post trauma.
90017	N.	Evaluation of hoarseness and dysphagia in 65 year old male including history and physical.
42145	O.	Uvulopalatal pharyngoplasty (UPP) for upper airway obstruction.
69930	P.	Cochlear implant in child with bilateral sensorineural hearing loss.
61526	Q.	Acoustic neuroma resection in adult, translabyrinthine.
21320	R.	Closed reduction of nasal fracture, with stabilization, post trauma in 20 year old male.
90020	S.	Rhinoplasty evaluation, 25 year old female, including history, physical and prolonged counseling, new patient.
31032	T.	Unilateral Caldwell-luc procedure for maxillary sinus disease, with polyp removal.
69200	U.	Removal of foreign body from ear canal without general anesthesia.

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Table 5 continued

Pathology		
<u>CPT Code</u>		<u>Service/Procedure</u>
88304	Std.	Examination of a gall bladder removed for cholelithiasis.
88309	A.	Examination of a total laryngectomy with bilateral neck dissection for squamous cell carcinoma of the larynx, post irradiation.
88302	B.	Examination of two segments of vas deferentia from a vasectomy to induce sterility.
88331	C.	Examination of a frozen section on breast biopsy, 2-3 centimeter specimen, in a 34 year old woman, frozen section diagnosis equals tubular carcinoma.
88312	E.	Examination of an acid fast stained slide of a necrotizing granulomatous lesion of lymph node.
80500	F.	Interpretation of serum immunoelectrophoresis.
88104	G.	Cytologic examination of a bronchial aspirate.
85060	H.	Interpretation of a peripheral blood smear showing atypical lymphocytes.
88305	I.	Examination of a posterior cervical lymph node biopsy in a 46 year old man with splenomegaly, anemia and adenopathy.
88173	J.	Interpretation of fine needle aspirate of the prostate, 10 smears.
80502	K.	Consultation in an intrapartum bleeding diathesis.
88305	L.	Examination of multiple endoscopically removed biopsies received in a single container from a patient with longstanding ulcerative colitis.

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Table 5 continued

Pathology	
<u>CPT Code</u>	<u>Service/Procedure</u>
88307	M. Examination of a hysterectomy and salpingo-oophorectomy in a 57 year old woman with vaginal bleeding and a slowly enlarging uterus and a 5 centimeter soft intramural nodule.
86078	N. Consultation for a transfusion reaction in a patient with abrupt onset of fever and back pain.
88305	O. Examination of a changing melanocytic lesion in a 26 year old woman.
80500	P. Interpretation of L/S (lecithin sphingomyelin) ratio for fetal maturity.
88305	Q. Examination of D&C (dilation and curettage) for bleeding in a postmenopausal woman.
80500	R. Clinical pathology consultation, limited - crystal analysis of synovial fluid from knee.

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Table 5 continued

Pediatrics		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Office visit, established patient, 6 year old child with sore throat and headache.
99152	A.	Attendance in delivery room with resuscitation of 2000 gram infant.
90040	B.	Office evaluation of diaper dermatitis, established patient.
90764	C.	Comprehensive well child visit at 6 months, established patient (AAP - American Academy of Pediatrics - Guidelines).
90763	D.	Comprehensive well child visit at 2 years, established patient (AAP - American Academy of Pediatrics - Guidelines).
90752	E.	Comprehensive well child visit at 5 years, new patient (AAP - American Academy of Pediatrics - Guidelines).
90751	F.	Comprehensive well child visit at 15 years, new patient (AAP - American Academy of Pediatrics - Guidelines).
90220	G.	Hospital admission for 18 month old child with 10% dehydration.
90020	H.	Initial visit of adolescent female with abdominal pain, new patient.
90060	I.	Office evaluation of head trauma in pre-school child with episode of vomiting, established patient.
99014	J.	2:00 A.M. phone call for crying child under 12 months.
31500	K.	Intubation of newborn.

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Table 5 continued

Pediatrics	
<u>CPT Code</u>	<u>Service/Procedure</u>
90020	L. Possibility of sexual abuse in 5 year old female, new patient.
24640	M. Closed reduction of a subluxation of the head of the radius at the elbow in a 4 year old male, office setting.
62270	N. Lumbar puncture of 5 year old for suspected meningitis.
90070	O. Follow-up visit for adolescent with behavior problem and difficult family, established patient.
12002	P. Repair of 2 inch laceration of scalp, 14 year old male, office setting.
81000	Q. Urinalysis with microscopic exam in office lab under your supervision, excluding collection.
90050	R. Office evaluation for possible purulent bacterial conjunctivitis with 1-2 day history of redness and discharge in 16 year old female (established patient).
90020	S. Initial office visit - evaluation of child with chronic wheezing.
99013	T. Phone call during office hours for child with rash on Amoxicillin.
69200	U. Removal of foreign body from ear canal without general anesthesia.

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Table 5 continued

Psychiatry		
<u>CPT Code</u>		<u>Service/Procedure</u>
90844	Std.	Second office visit after a referral from an internist of a 25 year old male suffering from panic attacks.
90520	A.	Emergency room evaluation and environmental intervention on behalf of 25 year old man who is hearing voices which tell him to kill his mother, brought to hospital by brother after attempt to stab his mother. Patient refuses admission to hospital.
90831	B.	Telephone conversation with mildly retarded mother of 18 year old schizophrenic male on Thorazine and Cogentin with severe dystonic reaction.
90844	C.	Follow-up psychotherapy office visit with 48 year old housewife for treatment of agoraphobia.
90620	D.	Hospital consultation for psychiatric evaluation of a 68 year old cardiac surgical patient with severe post-operative depression.
90825	E.	Evaluation of records and reports of a 69 year old woman admitted to hospital for work-up of pre-syncope episodes prior to arguments with her husband. The patient was seen by the psychiatric consultation team on 5 occasions during hospitalization.
90250	F.	Supportive repeat hospital visit with long-term stabilized 42 year old male with chronic schizophrenia on anti-psychotic medication.
90844	G.	Office visit for termination of 66 year old business executive from twice weekly in-office psychotherapy sessions after three years of psychotherapy. Patient had initial complaint of marital problems and "ulcers."

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Table 5 continued

Psychiatry	
<u>CPT Code</u>	<u>Service/Procedure</u>
90844	H. Weekly medical psychotherapy and pharmacotherapy office visit for a 36 year old woman who emigrated from Russia leaving her family behind. She presented initially with daily headaches which recently have been relieved with anti-depressant medication.
90847	I. Family psychotherapy session in hospital with husband of 28 year old woman with bipolar illness who periodically refuses to take Lithium. She functions well when on Lithium. The only previous time she stopped taking Lithium she required hospitalization.
90849	J. Multiple family group medical psychotherapy of families of inpatients on acute psychiatric care unit in a psychiatric hospital.
90853	K. Group medical psychotherapy in-office, of six patients seen weekly by same psychiatrist in individual medical psychotherapy for treatment of depression.
90520	L. Hospital emergency room evaluation of 78 year old woman who ingested alcohol and valium in an apparent suicide attempt.
90801	M. Office visit for diagnostic interview and evaluation of 17 year old male with recent personality change involving irritability, sleeplessness, and hostility towards parents and friends.

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Table 5 continued

Psychiatry	
<u>CPT Code</u>	<u>Service/Procedure</u>
90620	N. Office consultation for psychiatric evaluation of 65 year old male with intellectual deterioration and behavior problems including verbal and physical abuse of co-workers.
90862	O. Office visit for chemotherapy management of 44 year old male with bipolar depression.
90870	P. Electroconvulsive therapy, single seizure, in 82 year old widowed man hospitalized with severe depression. Anesthesiologist present.
90630	Q. Evaluation of 24 year old man charged with murdering a shopkeeper with regard to his competency to stand trial. You will be called upon as an expert witness.
90899	R. One supervisory conference with a team of nurses, social workers and mental health workers on an 8-bed acute inpatient psychiatric unit in a community hospital.
90801	S. Office visit for diagnostic reevaluation of 68 year old female with chronic depression, unresponsive to treatment.
90847	T. Office visit for family psychotherapy session with 38 year old father accused of incestuous relations with 12 year old daughter.
90844	U. Office visit for individual psychoanalysis with a 42 year old surgeon with a passive-aggressive personality disorder - fifth visit.
90630	V. Court-requested evaluation of juvenile who attempted to rape a 71 year old woman with regard to placement and recommended treatment.

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Table 5 continued

Psychiatry	
<u>CPT Code</u>	<u>Service/Procedure</u>
90620	W. Evaluation and level of care decision for 17 year old adolescent newly diagnosed schizophrenic with first psychiatric hospital admission. Patient has been hospitalized for 90 days with minimal functional improvement.
90889	X. Preparation of report to Department of Mental Health halfway house coordinator of three week hospitalization of 13 year old boy with socialized, aggressive conduct disorder. Psychiatrist has special knowledge of this child having already worked with him.

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Table 5 continued

Diagnostic Radiology		
<u>CPT Code</u>		<u>Service/Procedure</u>
74247	Std.	Upper GI (gastrointestinal) series, air contrast technique, with KUB (kidneys, ureters, bladder) for abdominal pain after meals with heme-positive stools, performance and interpretation.
75657	A.	Cervicocerebral angiography, selective catheter, including vessel origin; three or four vessels, complete procedure, for 66 year old patient with transient ischemic attacks, performance and interpretation.
71020-26	B.	Interpretation of chest x-rays, two views, frontal and lateral, for cough and weight loss.
71111-26	C.	Interpretation of bilateral rib x-rays, including posteroanterior chest, minimum 4 views, following trauma and questionable fracture.
74280	D.	Barium enema, double contrast, complete procedure, for occult GI bleeding in a 55 year old male, performance and interpretation.
76700	E.	Complete abdominal echography, B-scan and/or real time with image documentation, complete, for patient with fever of unknown origin performance and interpretation.
74160-26	F.	Interpretation of computerized axial tomography, abdomen; with contrast materials for patient with weight loss and questionable cancer of the pancreas.
76805	G.	Echography of the pregnant uterus, B-scan and/or real time with image documentation, complete, for questionable fetal abnormality, performance and interpretation.

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Table 5 continued

Diagnostic Radiology	
<u>CPT Code</u>	<u>Service/Procedure</u>
76361	H. Computerized tomography guidance for needle biopsy; complete procedure, lung mass.
73610-26	I. Interpretation of radiologic examination of the ankle, complete, minimum of three views, following trauma and questionable fracture.
76091-26	J. Interpretation of mammography, bilateral, for 50 year old patient with pain in breasts.
72140	K. Magnetic resonance imaging of the spinal cord, including spine, for unexplained onset of motor weakness in lower extremities, performance and interpretation.
74020-26	L. Interpretation of complete abdomen, including decubitus and/or erect views, for questionable intestinal obstruction.
74400	M. Intravenous urography, pyelography, including kidneys, ureters, and bladder, in patient with hematuria and flank pain, performance and interpretation.
75821	N. Venography, unilateral, complete procedure, for possible deep vein thrombosis of lower extremity, performance and interpretation.
70260-26	O. Interpretation of complete skull series for headaches in an adult.
78351-26	P. Interpretation of bone density study, dual photon absorptiometry of spine for possible osteoporosis.
72110-26	Q. Interpretation of lumbar spine x-rays, complete radiograph exam in an adult patient with low back pain.
74741	R. Hysterosalpingography, complete procedure, in 26 year old woman with infertility.

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Table 5 continued

Diagnostic Radiology	
<u>CPT Code</u>	<u>Service/Procedure</u>
72266	S. Performing and interpreting a lumbar myelogram, 68 year old female.
73510-26	T. Interpretation of hip x-rays, complete, for moderate/severe hip pain.

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Table 5 continued

Rheumatology		
<u>CPT Code</u>		<u>Service/Procedure</u>
90050	Std.	Follow-up office visit of patient with ARA (American Rheumatism Association) anatomical Stage II, and ARA (American Rheumatism Association) functional Class II, rheumatoid arthritis.
90020	A.	Initial office evaluation of patient with systemic lupus erythematosus, fever, seizures and profound thrombocytopenia.
73120-26	B.	Interpretation of x-rays of the hands, bilateral, in a patient with acute rheumatoid arthritis.
90020	C.	Initial office evaluation of 70 year old female with polyarthralgia.
90630	D.	Consultation in hospital, 35 year old female with fever, swelling joints and rash of one week duration.
20610	E.	Aspiration of synovial fluid from knee.
89051 89060	F.	Performance and interpretation of cell count with differential and crystal analysis of synovial fluid.
20550	G.	Injection of corticosteroid preparation into tendon sheath or trigger point.
90020	H.	Initial office evaluation of patient, with negative lab and x-ray studies, with question of fibrositis.
90060	I.	Follow-up visit for 45 year old patient with rheumatoid arthritis on gold, methotrexate or immunosuppressive therapy.

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Table 5 continued

Rheumatology	
<u>CPT Code</u>	<u>Service/Procedure</u>
90070	J. Follow-up visit for 40 year old mother of 3 with ARA (American Rheumatism Association) anatomical Stage III, ARA (American Rheumatism Association) functional Class III rheumatoid arthritis, and deteriorating function.
90020	K. Initial office evaluation and management of patient with systemic vasculitis and compromised circulation to the limbs.
78351-26	L. Interpretation of bone density study, dual photon absorptiometry of spine for question of osteoporosis.
90642	M. Follow up office consult of a 45 year old male with ankylosing spondylitis, iritis, and peripheral joint involvement.
90050	N. Limited office visit for established patient with known osteoarthritis and painful swollen knees.
90020	O. Comprehensive initial evaluation of a 48 year old man with recurrent low back pain radiating to the leg.
85651-26	P. Interpretation of sed rate, (ESR - erythrocyte sedimentation rate); Westergren type.
73510-26	Q. Interpretation of hip x-rays, complete, for moderate/severe hip pain.
85595-26	R. Interpretation of platelet count, Coulter counter.

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Table 5 continued

Thoracic/Cardiovascular Surgery		
<u>CPT Code</u>		<u>Service/Procedure</u>
33207	Std.	Permanent single chamber cardiac pacemaker implantation with single transvenous electrode insertion into ventricle in 70 year old female with bradyarhythmia, no acute MI (myocardial infarction) or significant co-morbidity.
33512-22	A.	Redo CABG (coronary artery bypass graft) (3 arteries); first reoperation in a 68 year old male, 3 year post original triple vein graft procedure, patent mammary artery, ejection fraction = 50%, with no complicating associated disease.
32020	B.	Chest tube insertion for spontaneous pneumothorax, in 20 year old.
90240	C.	Follow-up hospital visit, day 1 post-op chest tube insertion for spontaneous pneumothorax in 20 year old.
33512	D.	Primary triple vessel coronary artery bypass graft (CABGx3), 65 year old male, ejection fraction = 50%, with no complicating associated disease.
90250	E.	Hospital visit, day 2 post-op, following triple coronary artery bypass graft, 65 year old male, with no complicating associated disease.
90620	F.	Initial hospital evaluation of pulmonary tumor in 45 year old smoker, previously in good health.
31621	G.	Primary diagnostic fiberoptic bronchoscopy in patient with suspected bronchopulmonary lesion, without biopsy.
32480	H.	Left upper pulmonary lobectomy, for squamous bronchogenic carcinoma.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Thoracic/Cardiovascular Surgery

<u>CPT Code</u>	<u>Service/Procedure</u>
35081	I. Prosthetic graft replacement of 10 centimeter abdominal infrarenal aortic aneurysm in 65 year old male, elective repair, without significant co-morbidity.
39400	J. Mediastinoscopy in patient with suspected paratracheal lymph nodes.
90020	K. Extensive initial office evaluation of 70 year old woman with increasing dysphagia.
32000	L. Thoracentesis for total evacuation in patient with effusion and suspected pulmonary tumor.
33010	M. Initial pericardiocentesis, 35 year old male post chest trauma.
90020	N. Initial office evaluation of 50 year old male with aortic aneurysm, with respect to recommendation for surgery.
35301	O. Carotid endarterectomy, unilateral, 58 year old female, with history of transient ischemic attacks.
33681	P. Repair ventricular septal defect in 5 year old child.
33970 33971 33972	Q. Insertion, management, and subsequent removal of intra-aortic balloon pump immediately following CABG surgery. Device required for 48 hours.
31603	R. Tracheostomy, emergency procedure, transtracheal in adult for partial airway obstruction post trauma.
43110	S. Total esophagectomy with gastroesophageal anastomosis in chest.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Thoracic/Cardiovascular Surgery	
<u>CPT Code</u>	<u>Service/Procedure</u>
33405	T. Primary aortic valve replacement in 50 year old female, prosthetic valve, ejection fraction = 50%, with no complicating associated disease.
90020	U. Evaluation of a 65 office visit male, new patient, with chronic stable angina and coronary artery disease, referred by cardiologist for coronary bypass surgery.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Urology		
<u>CPT Code</u>		<u>Service/Procedure</u>
52000	Std.	Diagnostic cystoscopy in hospital, ambulatory surgery, in male with microhematuria.
51595	A.	Total cystectomy and ileal loop, urinary diversion, with total radical lymphadenectomy.
90250	B.	Follow up hospital visit 2 days post uncomplicated Transurethral resection of prostate (TURP) in 70 year old male.
52235	C.	Fulguration and resection of medium bladder tumor, 2 to 5 centimeters in 65 year old male.
90070	D.	Office evaluation of new onset right lower quadrant pain in a 32 year old woman, established patient.
54400	E.	Insertion of non-inflatable, semi-rigid, penile prosthesis in 60 year old male.
90610	F.	Initial consult for infertility in 35 year old male.
90017	G.	Initial office evaluation for diagnosis and management of painless gross hematuria in new patient, without cystoscopy.
52601	H.	Transurethral resection of prostate, TURP, medium sized gland for BPH (benign prostatic hypertrophy) in 70 year old male.
52000	I.	Diagnostic cystoscopy, office procedure in male with microhematuria.
90017	J.	Initial evaluation and management of recurrent renal calculi in 40 year old male.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 5 continued

Urology	
<u>CPT Code</u>	<u>Service/Procedure</u>
52234	K. Cystoscopic laser therapy for superficial bladder tumor, in hospital.
50080	L. Percutaneous nephrostolithotomy, one stage, 2 centimeter stone or less.
50590	M. Extracorporeal shock wave lithotripsy, single treatment, 2 centimeter single renal pelvic stone.
52336	N. Ureteroscopy with removal of calculus.
90017	O. Initial evaluation and management of recurrent urinary tract infection in female.
51726	P. Cystometrogram using calibrated electronic equipment for possible neurogenic disorder.
52332	Q. Cystourethroscopy with insertion of indwelling ureteral stent.
89320	R. Semen analysis for infertility.
90020	S. Initial evaluation and management of unexplained renal failure in a 40 year old female.
49505	T. Uncomplicated indirect inguinal hernia repair, 45 year old male.
55250	U. Bilateral vasectomy, including post-operative semen examinations.

NOTE: CPT-4 five-digit codes and/or nomenclature are copyright 1987 American Medical Association.

Table 6

Sample agenda: Second technical consulting panel meeting

June 29, 1987 - Westin Hotel, Copley Place

<u>Session 1</u>		<u>Leader</u>
6:00-7:30pm	Social hour and dinner	
7:30-8:30pm	Progress report and survey design and survey results	Braun
	Agenda for two-day meeting	
8:30-9:15pm	Practice Costs	Becker

June 30, 1987 - Harvard School of Public HealthIntroduction

8:30-8:40am	Goals of the meetings (Joint meeting)	Thomas
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Session 2

	Reliability and validity of survey information; derived preliminary RBRVS	
8:40-9:30am	Statistical methods to analyze data (Intra-class correlation, R^2 , de-meaned ratings, inhomogeneity, and missing values)	Yntema
9:30-10:15am	The RBRVS formula and calculations of pre- and post-operative time	Braun
10:15-10:30am	Coffee break	

Session 3

	Reasonableness of information obtained from survey (Small group meetings)	
10:30-11:30am	Review and discuss the reasonableness of ratings (total work time, intensity, and components)	Physician Leaders

Table 6 continued

Sample agenda: Second technical consulting panel meeting

<u>Session 4</u>	Evaluation of Intra-specialty <u>Leader</u> RBRVS and comparisons with charge based relative value scales	
11:30-12:45pm	Evaluate Pre- and post- operative time, Intra- specialty RBRVS and compare with Florida Relative Value Scale, California Relative Value Scale, Health Insurance Association of America	RBRVS Staff with Physician Leaders
12:45-1:45pm	Lunch	
<u>Session 5</u>	Extrapolation (joint meeting)	
1:45-2:15pm	Present and discuss extrap- olation methods: family of services and procedures, statistical and anatomical	Kelly
<u>Session 6</u>	Evaluation of extrapolation method by specialty (Small group meetings)	
2:15-3:15pm	Examine data on clusters of services and procedures (by family or statistical clustering methods)	Physician Leaders
3:15-3:30pm	Coffee break	
<u>Session 7</u>	Evaluation of alternative approaches to combine components (Joint meeting)	
3:30-4:00pm	Present multiplicative and additive models	Hsiao

Table 6 continued

Sample agenda: Second technical consulting panel meeting

<u>Session 8</u>	Summary (joint meeting)	<u>Leader</u>
4:00-4:30	Summarize major points and findings of the meeting and present future plans and follow-up	Hsiao

Table 7

List of cross-specialty panel members

Allergy & Immunology Roger Katz, M.D.	Los Angeles, CA
Anesthesiology H. Ketcham Morrell, M.D. Jess B. Weiss, M.D.	Marcellus, NY Boston, MA
Cardiology T. Joseph Reeves, M.D.	Beaumont, TX
Dermatology Fred Castrow, M.D.	Houston, TX
Family Practice James Jones, M.D.	Greenville, NC
Gastroenterology Bergein Overholt, M.D.	Knoxville, TN
Surgery Clarence Zimmerman, M.D. Alfred Clementi, M.D. James Weber, M.D. Sally Davis, M.D.	Boston, MA Arlington Hts. IL Jacksonville, AR Boston, MA
Internal Medicine William Felch, M.D. Robert Buxbaum, M.D. Eugene Ogrod II, M.D.	Rye, NY Boston, MA Sacramento, CA
Neurosurgery Merwin Bagan, M.D.	Concord, NH
Obstetrics and Gynecology William H. Coleman, M.D. Alan Lasnover, M.D. John Graham, M.D.	Scottsboro, Al Cupertino, CA Washington, DC
Ophthalmology Wayne Fung, M.D.	San Francisco, CA
Oral and Maxillofacial Surgery John Helfrick, D.D.S., M.S.	Houston, TX
Orthopedic Surgery Rufus F. Stanley, Jr., M.D. Clement B. Sledge, M.D.	Houston, TX Marblehead, MA

Table 7 continued

List of cross-specialty panel members

Otolaryngology

Charles Koopman, M.D.
William Lavelle, M.D.

Ann Arbor, MI
Everett, MA

Pathology

John C. Neff, M.D.

Columbus, OH

Pediatrics

Leonard A. Kutnik, M.D.

San Diego, CA

Psychiatry

Robert Dorwart, M.D.
Carol Nadelson, M.D.

Boston, MA
Brookline, MA

Radiology

Carl Bogardus, M.D.
Barbara Chick, M.D.

Oklahoma City, OK
Glen Falls, NY

Rheumatology

Arthur Weaver, M.D.
Matthew Liang, M.D.

Lincoln, NB
West Newton, MA

Thoracic/Cardiovascular Surgery

Benson B. Roe, M.D.

San Francisco, CA

Urology

Robert Wickham, M.D.

New York, NY

Table 8

Agenda for first resource-based relative value study
cross-specialty panel meeting December 11, 1986

Specialties present:

Allergy & Immunology, Cardiology, Dermatology, Family Practice, Gastroenterology, General Surgery, Internal Medicine, Neurological Surgery, Obstetrics & Gynecology, Orthopaedic Surgery, Otolaryngology, Pediatrics, Radiology, Rheumatology, Thoracic/Cardiovascular Surgery, Urology.

Agenda

Session 1 8:30 - 9:30	Introduction Alternative approaches to address the problem Background for cross-specialty comparisons Scope of meeting Tasks to be accomplished
Session 2	Discussion of "Same" Services Lists of "potentially Same" cross-specialty Services and Procedures Questionnaire results Choice of "selected Same" cross-specialty Services and Procedures
11:45 - 1:00	Lunch
Session 3 1:00 - 2:30	Discussion of Comparable Services and Procedures Description of selected services and procedures for reference Choice of comparable services and procedures
Session 4 2:30 - 4:00	Other approaches to cross-specialty comparisons

Table 8 continued

Agenda for first resource-based relative value study
cross-specialty panel meeting December 12, 1986

Specialties present:

Anesthesiology, Family Practice, General Surgery, Internal Medicine,
Obstetrics & Gynecology, Ophthalmology, Pathology, Psychiatry,
Therapeutic Radiology

Agenda

Session 1	Introduction
9:00 - 10:00	Progress report
	Background for cross-specialty comparisons
	Scope of meeting
	Tasks to be accomplished
Session 2	Discussion of Comparable Services and Procedures
10:00 - 12:00	Description of selected services and procedures for reference
	Choice of comparable services and procedures
	Choice of "Same" services and procedures
12:00 - 1:30	Lunch
Session 3	Alternative Approaches to Cross-Specialty
1:30 - 3:00	Comparisons

Table 9

Agenda for second cross-specialty panel meeting
December 14 - 15, 1987

Monday, December 14		
<u>Session</u>		<u>Leader</u>
Session 1	Introduction	Hsiao
2:00 - 3:00	Progress report	
	Cross-specialty method	
	Scope of the meeting	
	Discussion	
3:00 - 3:15	Coffee	
Session 2	Review of Services and Procedures	Braun/Couch
	Used as Cross-Links	
3:15 - 5:15	a priori same	
	a priori equivalent	
	a posteriori services and procedures	
5:15 - 5:30	Coffee	
Session 3	New Linkage	Braun
5:30 - 6:30		
7:00 - 7:30	Cocktails	
7:30	Dinner	
Tuesday, December 15		
8:00 - 8:30	Coffee	
Session 4	Pre- and Post-Time	Ketcham
8:30 - 9:15		
Session 5	Quantitative Methods	Yntema/Dunn
9:15 - 10:15	Statistical methods of "aligning scales"	
10:15 - 10:30	Coffee	
Session 6	Cross-Specialty RBRVS Scales	Braun/Hsiao
10:30 - 12:30	Critical review of the preliminary results	
12:30 - 1:14	Lunch	
Session 7	Alternative Approaches, Future Plans, and Summary	Hsiao
1:45 - 2:45		

Table 10

Agenda for third cross-specialty
panel meeting February 19, 1988

Specialties present:

Allergy & Immunology, Anesthesiology, Family Practice, General Surgery, Internal Medicine, Obstetrics & Gynecology, Ophthalmology, Oral and Maxillofacial Surgery, Orthopedic Surgery, Pathology, Radiology, and Rheumatology.

Agenda

Session

Leader

Session 1	Introduction	Braun
6:00 - 6:15	Scope of meeting	
	Tasks to be accomplished	

6:15-7:00	Dinner	
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Session

Session 2	Discussion of potential cross specialty links	Braun/Couch
6:15-10:00		

Session 3	Update on progress and future plans of the study	Hsiao
10:00-10:30		

Chapter 4

Pilot Analysis: Service and Procedure Work

4.1 Introduction

To develop valid and reliable estimates of total work and the dimensions of work, we needed to design a survey instrument that could accurately and efficiently collect this information. In this section, we discuss the methods used to design the survey and gather physician's ratings of work and the dimensions.

4.2 Pilot Survey Design

4.2.1 Objective

We designed the survey with several objectives in mind. First, the survey instrument had to be straight-forward and easily administered. Given the nature of the data being collected, any difficulty or confusion, either on the part of the interviewer or physician respondent, could result in an unacceptable survey bias (Fowler, 1985). Therefore, the survey instrument had to be carefully constructed and pretested.

Second, the survey instrument had to be relatively brief. If the survey instrument required too much physician time, it could adversely affect response rates and the quality of the data. Conversely, however, if the survey instrument was too short, it could compromise our ability to extrapolate to unsurveyed services within a specialty. After consultation with experts, we settled on a questionnaire that did not exceed 30 minutes.

A third objective in designing our survey instrument was to permit the gathering of data about pre- and post-service time and other selected demographic characteristics of the physician. These demographic characteristics included information such as board certification, practice setting, years of experience, and income levels. These are described later in the analysis.

After reviewing our objectives with survey experts, it was decided that a telephone survey was the most feasible approach. Other alternatives, such as a mailed survey, would not permit the level of supervision and quality control we felt was absolutely necessary. Another alternative approach for interviewing, one-on-one physician interviews, was seen as prohibitively expensive and time-consuming.

However, several major questions remained unanswered about using telephones in administering surveys on intra-service work via the magnitude estimation technique. First, could a telephone survey instrument be designed which would meet the objectives outlined above? Second, would the instrument procedure produce reliable estimates of intra-work which could be validated empirically? Third, would these results be confirmed by our technical consultant group members and other knowledgeable medical experts or practicing physicians?

4.2.2 Questionnaire Development

In the previous chapter, we discussed the lists of services developed by the TCG panelists to survey each specialty. The

structure of the questionnaire evolved through a process that involved several interactions. First, based on our experience from the previous two studies and the expertise of Dr. Jack Fowler and the survey staff at the Center for Survey Research (CSR), we constructed a sample questionnaire that included questions on all the major dimensions of work. These questionnaires were administered to TCG members over the course of the meetings in the summer of 1986. After the questionnaire was administered, TCG panelists were questioned about the survey and any problems encountered. These comments were then used to refine subsequent questionnaires and the process was repeated at the TCG meetings.

Prior to both the pilot and national survey, we pretested the survey instruments. Between three and seven physicians were selected for each specialty from physicians practicing in the specialty in Massachusetts for the pretest. All pretest interviews were taped with the physicians' consent and conducted by an experienced interviewer.

At the end of each interview, physicians were asked a series of questions to evaluate any difficulties or problems they encountered with the mailed presurvey materials, questionnaire, standard used for magnitude estimation or any of the services included. If necessary, questionnaires were modified and again pretested. A copy of the questionnaires used in the pilot survey is attached in Appendix G. The list of services for the pilot survey is attached in Table 11.

4.3 Pilot RBRVS Survey

4.3.1 Specialties Surveyed

To test the feasibility and reliability of our telephone survey and our magnitude estimation methodology, we conducted a pilot study of physicians from four specialties. The four specialties in the pilot survey were: general surgery, internal medicine, anesthesiology, and radiology (including both general and diagnostic radiology). We selected these four specialties because they represented a broad spectrum of the different major types of work performed by physicians: 1) invasive services, 2) management and evaluation, 3) laboratory testing, and 4) imaging.

4.3.2 Selection of Physician Sample

In selecting a random sample of physicians to be surveyed for the pilot study, we used the 1986 American Medical Association's (AMA) Physician Masterfile (AMA, 1987). The Masterfile contains data on every known Doctor of Medicine in the United States, including both members and nonmembers of the AMA. For the pilot survey, we limited the sample to nonfederal, patient care physicians in the New England Census Division (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) and New York State.

The AMA drew samples to reflect specialty-specific physician distributions within each state. We excluded physicians if they 1) worked in patient care less than 20 hours per week, 2) were in

residency training, 3) were over 65 years of age, or 4) had no current address in the AMA Masterfile.

Our goal was to survey approximately 100 physicians in each specialty with radiology being divided into 50 general radiologists and 50 diagnostic radiologists.

4.3.3 Interviewer Training and Supervision

The interviews were carried out by interviewers at CSR who were members of CSR's professional interviewing staff. All interviewers at the Center received a minimum of three full days of training, including supervised practice, in general standardized, non-directive interviewing techniques. All interviewers had previous telephone survey experience. Interviewers were formally briefed on the RBRVS project and the purpose of the study, the specific procedures to be used in the study, and the survey instrument.

In addition, interviewers were instructed by RBRVS project staff on the correct pronunciation of the services and the general nature of the service being discussed. CSR subsequently tested each interviewer orally to insure that all services could be accurately pronounced before they were allowed to carry out interviews for a specialty.

4.3.4 Field Procedures

4.3.4.1 First Phase

Telephone calls were placed to physician's office staff to prescreen physicians and ensure that they met the physician survey criteria described above. Each physician remaining in the sample after the initial presurvey screening was sent a package of material that included the following:

- A letter from the principal investigators at Harvard describing the purposes of the study and asking for cooperation.
- A letter from the American Medical Association urging cooperation.
- A description of the magnitude estimation method to be used in the ratings.
- A list of the services and procedures the physicians would be asked to rate.
- A description of the dimensions physicians would be asked to make.

These letters are attached in Appendix H.

Several days after the package was mailed, an interviewer called the physicians' office, checked to make sure the package had arrived, and attempted to arrange a time to speak with the physician.

Overall, as shown in Table 12, of the total of 500 names from the AMA list, 84 names never produced a telephone number where anyone knew the identity or location of the selected

doctors. In addition, there were cases for which we obtained a number somewhere, either from the AMA listing or from Directory Assistance, but no one ever answered the number after a minimum of ten calls at different times of the day and days of the week.

Finally, the sample was further depleted by five physicians who were found to be retired and two physicians whom we were told had moved out of the study area. Hence, there was a total of 396 physicians for whom we were able to locate a telephone number and appeared to be eligible for the survey.

4.3.4.2 Second Phase

In some cases, when speaking directly with the physicians, it was found that they were still not eligible for the survey. In some cases, these physicians were identified as working less than 20 hours in clinical practice or being in a resident training program. In addition, some physicians indicated they were unfamiliar with the standard service against which other services were compared. Subsequently, these physicians were dropped from the sample.

As a general rule, we instructed CSR to drop physicians who were unable to rate at least half the services and procedures listed for the specialty. Occasionally, a physician was found who did not provide the "standard service" or whose practice was so specialized that he or she did not feel familiar with the majority of the services to be rated. Since the purpose of the

pilot study was to have informed ratings, these physicians were also dropped from the sample.

Table 13 summarizes the final summary statistics for the pilot survey sample and the reasons for their exclusion. Of interest is the fact that eight physicians classified themselves as too specialized to answer the questions. These physicians represent only a small percentage of the eligible sample (two percent) so they should not present any systematic bias. Moreover, these eight physicians were equally divided among the four specialties being surveyed.

4.3.5 Physician Response Rate

Table 14 reports the number of interviews and response rates by specialty for physicians surveyed in the pilot survey. Overall, a 73.1 percent response rate was achieved for physicians in the pilot survey. This response rate was generally typical of all the specialties surveyed with the exception of internal medicine. For internal medicine, only 54 of 91 physicians responded for a 59.3 percent response rate.

The major reason for not being surveyed was the physician's unwillingness to participate. Overall, 65 physicians or 17.9 percent of the eligible sample refused to participate. As might be expected due to their low response rate, the highest refusal rate was for internal medicine. Slightly over one-third (34.1 percent) of the eligible sample of internists declined being

interviewed. This rate was more than double any of the other specialties.

It should be noted that the interviewing for surgeons began later than the other specialties. In all probability, CSR speculated that the response rate for surgeons might have been higher if the data collection period had been extended.

With respect to internal medicine it is clear from Table 14 that internists were more reluctant to cooperate than any other physician specialty. While it is true they were harder to schedule, the vast majority of those not interviewed refused. In most cases, after an initial refusal, they were sent a follow-up letter stressing the importance of the study and adding reasons why cooperation might be worth their while. Interviewers insisted on talking directly with the doctor, not accepting a proxy refusal except in a small number of cases. Hence, in fact, most of those internal medicine specialists not interviewed personally refused twice.

4.4 Technical Analysis

The purpose of the pilot study was to investigate the suitability of the methods used to obtain the physicians' judgments, especially their judgments of work. The important question is, therefore, whether the judgments were realistic -- or in psychologists' language, whether they were valid. We have no prior, external scale of work to which the judgments can be compared to assess their validity. We can, however, ask whether

they seem reasonable, and more important, whether they are self-consistent in ways in which they should be if they are realistic.

Each of the analyses described here was done four times, once for each specialty. The pilot study was not designed to permit any extensive comparison between specialties.

4.4.1 The Use of Logarithms

Before the numerical judgments of work, time, technical skill, physical effort, mental effort, and stress due to risk were analyzed, each judgment from each physician was transformed by taking its logarithm to the base 10. The logarithmic transformation was chosen because it simplified the statistical analysis. In most cases, the logarithms of the judgments of the different dimensions (i.e., work, time and so on) required by a particular procedure looked like a sample from a distribution that was reasonably normal, and the variances of the samples did not have any strong, obvious relation to their means. Approximate normality and approximate equality of variance are highly desirable; without them, many common statistics, like means and standard deviations, are difficult to interpret, and some procedures, like multiple linear regressions may be dangerously misleading. That the logarithmic transformation provided approximate normality and equality of variance was not unexpected. Psychologists who have used the method of magnitude estimation in laboratory experiments on sensation have long been

accustomed to working with the logarithms of the numerical judgments (Stevens, 1975).

To save words, "rating" will be used as an abbreviation for "logarithm to the base 10 of the numerical judgment of magnitude," or in the case of time, "logarithm to the base 10 of the judged number of minutes."

4.4.2 Policy About Outliers and Dropping Physicians

Some ratings were missing: sometimes a physician was unwilling to make a judgment about one of the attributes (work, time, skill, physical effort, mental effort, or risk) of one of the services. A few other ratings were obvious outliers---e.g., differed from the typical rating by as much as 1.7 on the log scale (equivalent to a factor of 50 on the scale of unlogged judgments). In deciding which ratings should be treated as outliers, the set of ratings given by a particular specialty about a particular attribute of a particular service was examined: deviant responses were deleted one by one until no response differed from the mean of the remaining ratings by more than three standard deviations of the remaining ratings. Ratings thus deleted were considered outliers and were treated as missing. In what follows, when we use the term "missing ratings", we will include both outliers (ratings exceeding three standard deviations) and ratings that were truly missing.

Any physician for whom more than 45 percent of the ratings were then missing was dropped from the analysis: 4 of the 75

specialists in anesthesiology were dropped; 5 of the 68 in radiology; 6 of the 69 in general surgery; and 1 of the 54 in internal medicine. It was felt that the judgments of physicians who were so often unwilling or unable to respond were of questionable value.

There remained a total of 249 physicians. If each had given 17 judgments about work, there would have been 4,233 ratings of work. Of those 4,233 ratings, 352 (8.3 percent) were missing: 332 (7.8 percent) were truly missing, and 20 (0.5 percent) were outliers. Later, in Table 15 we show the breakdown, by specialty and by service, of the 3,881 ratings of work that were not missing.

The idea of treating outliers as missing observations may be startling, but there are precedents. In estimating the mean of a population in which there are thought to be outliers, it is common practice to use one of a variety of schemes in which each observation is weighted according to its distance from the apparent mean of the population, the weight decreasing gradually as the distance increases. The biweight scheme described by Mosteller and Tukey (1977, p. 205) is one example. We have used a somewhat similar scheme: an observation within three standard deviations was given full weight; outside of three standard deviations, zero weight. In principle it would be desirable to let the weight decrease gradually with distance from the mean, but the available version of Estimation-Maximization did not permit us to do so. It distinguishes only between observations

that are missing and those that are not, and it gives full weight to any observation that is not missing.

4.4.3 Group Ratings of Work Required by a Service

Consider the data about work obtained from the physicians in a specialty. Their ratings (the logarithms of their numerical judgments about work) can be laid out in a table in which there is a row for each of the 53 to 70 physicians who were not dropped, and a column for each of the 17 ratings about which the physicians in the specialty were asked. This table will be called the array of ratings of work. A few of the entries in it are missing (6 percent to 12 percent, depending on the specialty).

The rows in that array can be regarded as a random sample from a large population of rows. We can imagine a very large array with the same 17 columns, but with many, many rows, and no missing entries: the 53 to 70 rows in the array of ratings of work can be regarded as a random sample from the rows of the large array, but with a few entries missing. We would like to have estimates of the means of the 17 columns of the large array -- i.e., an estimate of the population mean of the ratings of each of the 17 services.

The estimates could be made very simply if the table of work ratings had no missing entries: the means of its columns would be the estimates of the means of the columns of the large array. Because there were missing entries, a more complex procedure

called the Estimation Maximization algorithm (Dempster, Laird, and Rubin, 1966; Little and Rubin, 1987) was used. The version that was used here (Orchard and Woodward, 1972) provided, inter alia, an estimate of the mean of each column of the large array and an estimate of the standard deviation of each of those columns. (To the extent that the rows of the large array have a multivariate normal distribution, these estimates are maximum-likelihood estimates, and are sufficient estimates; that is, they extract from the table of work ratings all possible information about the parameters of the population.) An approximate estimate of the standard error of the sample mean was obtained by simply dividing the estimate of the standard deviation by the square root of the number of physicians from whom there were non-missing ratings of the work the service required. (This estimate of the standard error is if anything a trifle too large. The Estimation-Maximization algorithm in effect makes inferences about physicians who did not respond, and so its estimate of the mean rating for a service is not based entirely on the physicians who gave responses about the service; the estimate is in effect based on a slightly larger number of physicians.)

Table 15 show the resulting estimates of the means and their standard errors. Each row shows for one of the 17 services: (a) the estimate of the mean of the population of ratings; (b) the estimate of the standard error of that mean; (c) the anti-logarithms of the estimate of the mean (labelled

"Geometric mean"); (d) an approximate estimate of the standard error of that anti-logarithm (this column will be explained in a moment); (e) an abbreviated description of the service; and (f) in parentheses, the number of non-missing ratings in the corresponding column of the array of ratings of work. At the bottom of the table is a brief description of the service the physicians were asked to use as the standard -- i.e., as requiring 100 units of work. The standard therefore stands at 2.0 on the logarithmic scale of ratings.

In interpreting those four tables, it is helpful to note that the antilogarithm of the estimate of the mean is an estimate of the geometric mean of the population of unlogged judgments of the work the service requires. It appears in the third column of the table. The fourth column is an approximate estimate of the standard error of the geometric mean: the standard error is expressed as a percent. To be explicit, if a is the entry in the second column, the entry in the fourth is

$$100 \cdot (10^a - 1).$$

To the extent that the population of ratings is indeed normal, fourth column provides 68 percent confidence limits on the geometric mean in the third column: for example, if the geometric mean is 250 and the entry in the fourth column is 7.0, then 68 percent confidence limits on the geometric mean of the population of unlogged judgments of work are $250/1.070$ and 250×1.070 . (This follows from the fact that 68 percent of the

members of a population with a normal distribution lie no further than one standard deviation from the mean.)

It is also worth noting that when the distribution of ratings of work (i.e., the logged judgments) is symmetric about its mean, the median and geometric mean of the population of unlogged judgments are the same. The distribution of the ratings was in all cases reasonably symmetric; so no serious error is committed if the geometric means in Table 15 are regarded as estimates of the population medians of the original unlogged judgments.

For the most part, TCG panelists and other physicians who were asked to look informally at those four tables felt that within a specialty the ratios of the anti-logarithms (i.e., the ratios of estimates of the geometric means of judgments of work) seemed reasonable. Based on this clinical feedback and the positive reaction from our statistical and measurement consultants, we were very encouraged with the method. Judgments that had been obtained earlier by alternative methods other than magnitude estimation seemed so unreasonable that those approaches were abandoned. With this encouragement we turned to questions about the reliability and consistency of the magnitude estimation approach.

4.4.4 Reliability of Responses about Work

One way to examine the degree to which physicians within a specialty agree on their ratings of work is to consider what is

known as the reliability of a physician's ratings of work. The reliability of the ratings is a measure of their reproducibility. Within a specialty, it shows how well individual physicians agree.

Reliabilities were estimated by the method of intraclass correlation (Winer, 1971, pp. 283-287). The estimates were made specialty by specialty. Because some of the entries in the table of ratings of work were missing, the mean squares that enter into the computation of the intraclass correlation were obtained by a procedure that takes account of missing values (Snedecor and Cochran, 1980). This procedure does not treat missing values in quite the way the Estimation-Maximization procedure does, but it is customarily used in the computation of intraclass correlations.

The intraclass correlation for each specialty is shown in Table 16 in the column headed "Individual Physician." To understand its meaning, suppose there were no missing entries in the array of ratings of work. And suppose that for each of the possible pairs of rows in that array, the coefficient of correlation between the 17 ratings in one row for one physician and the 17 in the row for the other was computed: the average of all those correlations would be approximately the intraclass correlation. (It would be exactly the intraclass correlation if the variances of the columns of the array of ratings of work were all the same.)

Although reporting intraclass correlations is customary in psychology, they are not so meaningful here as are the reliabilities shown in Table 16 in the column headed "Mean of Sample of Physicians." Each of these new reliabilities was obtained from the intraclass correlation by the Spearman-Brown prediction formula (Winer, 1971, p. 286).

To understand the meaning of this new reliability, suppose that two samples of physicians, both of the same size as our sample, were drawn from the population of physicians, and that there were no missing ratings in either sample; and suppose that in each sample, the mean of the ratings were computed for each of the 17 services. The reliability in the final column of the table is a prediction, again approximate, of what the correlation between the two sets of means would be. The column indicates that two samples of physicians would agree extremely well in their mean ratings of work.

Note that the reliabilities shown in Table 16 would no doubt be a little lower if aberrant ratings had not been discarded. These reliabilities are only marginally relevant to our interest in constructing and evaluating a scale of relative values. We have reported them because it is conventional to do so, and because they may be useful to future investigators who need to decide how many physicians to survey. The consistency analysis in the next section provides a more direct kind of evidence that the group ratings of work that were obtained from

magnitude estimation and the Estimation-Maximization algorithm are reliable.

4.4.5 Consistency Between the Group Ratings of Work and Group Values of Other Dimensions

It is conceivable that even though two groups of 50 to 70 experts would agree, they could both be wrong. That possibility can be explored by asking whether the ratings of the work required by different services can be predicted from the ratings of the other attributes of those services. If they can be, then unless some other plausible reason can be found, it is difficult to avoid the conclusion that the reason the ratings of work can be predicted from the others is that all the ratings are based on reality.

The analysis was again done one specialty at a time. Consider an array that includes all the ratings that the physicians in the specialty gave for the dimensions of the 17 services. There is a row for each of the physicians in the sample, and there are five times 17 columns. The first 17 are the ratings of time. The next 17 are the ratings of skill, and so on for physical effort, mental effort, and risk. This will be called the array of ratings of the dimensions. Like the array of ratings of work, it has some missing entries.

We have already explained that the Estimation-Maximization procedure was used to obtain, for each of the columns of the array of ratings of work, an estimate of the mean of the

population from which the ratings in the column were drawn. The Estimation-Maximization procedure was now applied to the array of ratings of the dimensions, and it provided for each column of that array an estimate of the mean of the population from which the ratings in the column were drawn. These estimates are shown in Table 17. We also report these mean ratings on the untransformed scale in Table 18 for comparison. For convenience, the estimated mean ratings of work that were shown in Table 15 are repeated in these new tables.

For each specialty, we then had, for each of the 17 services, six estimates of population means: an estimate for work, and an estimate for each of the five dimensions. The question was whether the estimate for work could be predicted from the estimates for the dimensions.

We began by using multiple linear regression to make the predictions, and it worked so well that we saw no need to try other schemes. Each of the 17 estimates of the means for work was treated as a value of the dependent variable, and the corresponding estimates of the means for the five dimensions of the service were treated as the corresponding values of five predictor variables.

Table 19 shows the results. The rows headed "Regression Coefficients" show the coefficients the predictors have in the regression equation, and show the constant term in the equation. In parentheses beside each coefficient is its level of significance -- i.e., the level of significance at which the

coefficient differs from zero. The row labelled " R^2 " shows the square of the correlation between the dependent variable and the predicted value obtained from the regression equation. (Some users of regression may prefer what is known as the adjusted R^2 . Reading across the table from left to right, the values of the adjusted R^2 are .9912, .9939, .9979, and .9853.)

Those values of R^2 are startlingly close to unity. They show that to a remarkable extent, the estimates of mean ratings of work can be predicted from the estimates of the mean ratings of the five components.

Although the values of R^2 are very high, they are not quite unity: the predictions of the group ratings of work are not quite perfect. There are two possible sources of the small imperfections in the predictions. First, the group ratings obtained from the Estimation-Maximization procedure are presumably subject to random errors; i.e., they are not perfectly reliable. Second, even if those random errors could be eliminated -- i.e., if the group ratings of work and its dimensions could be measured with perfect reliability -- the regression equation presumably would not be a perfect description of the relation between the ratings of work and its dimensions. The remarkably high values of R^2 imply that the imperfections of both types must be very small.

To be explicit, each R^2 shown in the table is a conservative, worst-case estimate of the square of the correlation between the observed and predicted group ratings of

work would be if we could replace the regression equation by an
the ratings of work and its dimensions. This shows that the
random errors in the group ratings are small; in other words, the
group ratings are highly reliable. Indeed it can be shown that
if reliability is defined in terms of intraclass correlation,
each R^2 in Table 19 is an estimate of a lower bound on the
reliability of the specialty's group ratings of work. It is a
very direct estimate, not confused by the fact that some of the
individual ratings were discarded as aberrant. It shows that the
method of magnitude estimation and our treatment of its results
produced group ratings of high reliability.

Similarly, the R^2 in Table 19 is a conservative estimate of
the square of the correlation that would be obtained if the
predictions could have been made from error-free ratings of work
and its dimensions. We therefore conclude that the imperfections
in the regression equation are small. This conclusion has two
important implications. First, the five dimensions of work were
chosen very successfully: their ratings determine the rating of
work with remarkable exactness; so it seems the attempt to
identify dimensions of work, an attempt that was admittedly based
partly on intuition and judgment, was very successful.

Second, since the group ratings of work can be predicted so
exactly from the ratings of the five dimensions, the six kinds
of ratings must be highly consistent with each other. It is
difficult to see how they could be so consistent unless they were

all valid -- i.e., realistic. All in all, we regard these high values of R^2 as the most persuasive evidence that the group ratings of work are trustworthy.

4.4.6 Consistency within the Ratings of Individual Physicians

The analysis that has just been described examined consistency in the typical ratings from a group of 53 to 70 physicians. A similar analysis can be made at the level of the individual physicians. We can examine the deviation of a physician's ratings from the group norm, and can ask whether the deviations in his or her ratings of work can be predicted from the way his or her corresponding ratings of the other five attributes of the service differ from the norm of the group.

Technically, the analysis of the data from a specialty was an analysis of covariance with two factors: physician and service. Thus each cell was the intersection of a row and column of the array of ratings of work. The dependent variable was the rating of work; so each cell contained at most one observation of the dependent variable, and a few of the cells were empty. Associated with each non-missing value of the dependent variable were the values of five covariates--i.e., the corresponding ratings of time, skill, and so on.

A few of the values of the covariates were missing. They were estimated by what is known in BMDP as the "regression" method of estimating missing values: the estimates used the statistics obtained by applying the Estimation-Maximization

procedure to the array of ratings of the dimensions, an array that was described earlier. Empty cells were handled by the method of least squares -- i.e., by using multiple linear regression with dummy variables that distinguished between physicians and between services.

In this analysis we have three kinds of predictive information: the identities of the physicians (the dummy variables that distinguish between physicians); the identities of the services (the dummy variables that distinguish between services); and the physician's ratings of the dimensions (the covariates). Table 20 shows the residual sums of squares obtained when those kinds of information are used, singly or in combination, to predict the values of the dependent variables -- i.e., to predict individual physicians' ratings of the work required by particular services. The table also shows the total sum of squares -- i.e., the sum of the squares of the deviations of the values of the dependent variable from their mean. Table 21 shows the regression coefficients of the ratings of the dimensions (i.e., the weights of the covariates) in the analysis from which the sum of squares labelled E was obtained. The level of significance of each coefficient is shown under it in parentheses.

Most of the sums of squares in Table 20 are shown only for completeness. In what follows, we shall be concerned only with those labelled D and E.

To understand what they mean, let us imagine the array of ratings of work altered in the following way: first, subtract from each entry the mean of the entries in its row; then in the resulting array, subtract from each entry the mean of the entries in its column. When the array of ratings of work has been altered in that fashion, it becomes the array of physician-by-service interactions. By subtracting the mean of the row, we essentially put all physicians in the specialty on the same footing: for each physician, the sum of the 17 ratings of work is zero when the ratings have been adjusted in that way. Then, by subtracting the mean of the column, we find how much the adjusted rating differs from the group norm -- i.e., from the group mean of the adjusted ratings for the service.

The question is how well those interactions can be predicted from the corresponding interactions in the physicians' ratings of the dimensions. That is, if a physician gives an unusually high adjusted rating of the work a service requires, are his or her adjusted ratings of the other dimensions of that service unusually high?

The sum of squares labelled D is the sum of the squares of the interactions. The larger it is, the more the physicians' adjusted ratings of work differ from the group norms. The difference between the sums of squares labelled D and E is the part of the sum of the squares of the interactions that can be ascribed to the corresponding interactions in the ratings of the dimensions. It is shown at the bottom of the table. In every

specialty, it is significantly different from zero at a level far beyond 0.1 percent, and in every specialty it is a non-trivial fraction of D.

So, to put it a bit informally, the deviation from typicality of a rating of work is, to a non-trivial extent, predictable from the deviations from typicality of the physician's rating of the time, skill, etc. that the service requires. It is therefore difficult to avoid the conclusion that the ratings are at least in part due to the reality of the individual physician's experience in practicing medicine.

4.4.7 An Alternative Explanation?

The fact that the ratings of work are remarkably consistent with the ratings of the dimensions at the level of the group of physicians, and to a lesser degree, even at the level of the individual physician, suggests that all the ratings are based on reality. Indeed, we are forced to that conclusion unless some plausible alternative explanation of the consistency can be found.

So far, only one has been proposed. Some have suggested that if we looked at one service after another, we would perhaps find that within a specialty the ratings of different attributes--work, time, and so on -- tended to move up and down together: when the rating of work is large, the ratings of time is also large, and so on. The ratings would move together in that fashion if the judgments about different attributes of a service

had a strong influence on each other, or if they were all influenced alike by some external factor -- e.g., the usual fee for the service or specialty bias towards the service. In either case, the judgments would be highly consistent, but they might be far from realistic.

If the ratings of the six attributes did move up and down in unison, then it should be possible to predict a specialty's typical ratings of work from an average of the typical ratings of the other attributes. We therefore tried replacing the five predictors by one composite predictor that was a sort of average of the five. The 17 values of a predictor were converted to Z-scores (i.e., subjected to a linear transformation that would make their mean be zero and their standard deviation be unity). Then the five Z-scores that pertained to a service were summed to obtain the service's value of the composite. The dependent variable, mean rating of work, was regressed on the composite, with a constant term.

The resulting values of R^2 are shown in Table 22 in the columns headed "composite predictor." The values of R^2 obtained with five predictors (see Table 19) are repeated here for comparison. The predictions with the composite predictor are much poorer than they were with five predictors; in each specialty R^2 is much smaller. F-tests show that in each specialty the change in R^2 is significant far, far beyond the 0.1 percent level. (Each of the four F s has 4 and 11 degrees of freedom, and each is larger than 90.) Thus, the hypothesis that

the responses about the six attributes move in unison cannot by itself explain the fact that the rating of work is so remarkably consistent with the other ratings.

The levels of significance in Table 19 lead to the same conclusion, though not quite so clearly. The level of significance of a regression coefficient refers to the null hypothesis that in the presence of the other predictors, this predictor adds nothing to the success of the prediction. If the predictors did move up and down in unison, then discarding any one of them should have no effect on the prediction, and so none of the regression coefficients should be statistically significant. But Table 19 shows that at least some of them are statistically significant in every specialty, again showing that the alternative explanation is inadequate.

The significance levels shown in Table 21 lead to a similar conclusion about individual physicians' ratings of work, but here the evidence is very clear. Here again, no predictor should have a significant coefficient if the predictors move up and down in unison, but in every specialty some of the predictors do have significant coefficients. (Because this conclusion was clear, it did not seem worthwhile to construct a composite predictor here.) The success of the predictions of individual physicians' ratings of work cannot be explained, at least not entirely, by supposing the ratings move up and down together.

In general, we conclude that the six ratings do not move up and down in strict unison. They move and shift around in a more

complicated manner, as would be expected if they are realistic: i.e., a service that requires an unusual amount of time does not necessarily require unusual skill. And yet they move around in such a way that the rating of work can be predicted from the others, as would be expected if the ratings are all realistic and work is indeed determined very precisely by the other attributes. So, while the responses may conceivably be distorted by a tendency to move in unison, we are forced to conclude that, to put it conservatively, they have some truth in them.

4.5 Summarizing the Results of the Analysis

The group values of work displayed in Table 15 seemed reasonable, and the data showed three kinds of self-consistency that they might be expected to show if the judgments about work and about its attributes were in fact realistic. First, the estimates of reliability (Table 16) imply that the group values of work obtained from two groups of 53 to 70 physicians from the same specialty would agree extremely well. Second, within a specialty, the group values of work are remarkably consistent with the group values of time, skill, etc. Third, when an individual physician's rating of work deviates from the group's typical rating of the work the service requires, the deviation is to some extent consistent with the deviations from typicality of his or her ratings of the other attributes of the service. Unless some other plausible explanation of those three kinds of consistency can be found, it is difficult to avoid the conclusion

that the group values of work shown in Table 15 are accurate reflections of the reality of medical practice.

So far, only one plausible alternative has been proposed. The second and third kinds of consistency could be explained by assuming that a physician's ratings of the six attributes--work, time, etc.--tend to move up and down in unison, perhaps because the judgments influence each other, or because they are influenced by some outside factor that has little to do with reality. That explanation was unable to account for all the consistency that was observed, though it may perhaps account for some.

In sum, the results of these analyses are extremely encouraging. They give reason to suppose that in the long run, experience will show that the method of magnitude estimation gives accurate information about work and about the other attributes of services. Encouraged by these results, we moved ahead with the national survey.

Table 11

List of surveyed services and procedures used
in the pilot survey: Anesthesiology

<u>Service/Procedure</u>	
Std.	Anesthesia for inguinal hernia repair.
A.	Anesthesia for procedures on heart, with pump oxygenator (coronary artery bypass graft and/or cardiac valve).
B.	Anesthesia for cystoscopy.
C.	Anesthesia for colectomy.
D.	Anesthesia for cholecystectomy.
E.	Anesthesia for total hip replacement.
F.	Insertion of a Swanz Ganz catheter.
G.	Anesthesia for knee arthroscopy.
H.	Anesthesia for open reduction and internal fixation of hip fracture.
I.	Anesthesia for repair of abdominal aortic aneurysm.
J.	Anesthesia for dilation and curettage (D&C) of uterus.
K.	Anesthesia for lens surgery (cataract extraction with or without insertion of prosthesis).
L.	An evaluation of 63 year old (ICU) patient in intensive care unit care unit with diabetes and chronic renal failure who develops Adult Respiratory Distress Syndrome 36 hours post mitral valve replacement.
M.	A brachial plexus nerve block for upper extremity operation.
N.	An injection of anesthetic substance, therapeutic, epidural (single epidural block for pain).
O.	Anesthesia for modified radical mastectomy.
P.	Anesthesia for transurethral resection of prostate (TURP).
Q.	A consultation for transfusion reaction in patient with abrupt onset of fever and back pain.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: General surgery

Service/Procedure

- Std. An uncomplicated indirect inguinal hernia repair in a 45 year old male.
- A. Esophagogastrectomy for esophageal carcinoma.
- B. Rigid sigmoidoscopy without biopsy in office.
- C. Appendectomy for acute abdomen with appendicitis.
- D. Office evaluation of new right lower quadrant pain in a 32 year old woman established patient.
- E. Low anterior resection for rectal carcinoma.
- F. Office visit for preoperative evaluation of a patient with primary hyperparathyroidism.
- G. Modified radical mastectomy.
- H. Cholecystectomy for cholelithiasis.
- I. Diagnostic bronchoscopy in a patient with suspected lesion.
- J. Emergency room evaluation of a 25 year old motorcycle victim with multiple trauma.
- K. Phone consultation for patient at home (1:30 a.m.) regarding new onset of belching, abdominal pain, and nausea in 62 year old man.
- L. Parathyroidectomy for primary hyperparathyroidism in 50 year old woman.
- M. Direct hospital admission, 45 year old female new patient with acute cholecystitis.
- N. Initial critical care management for a 65 year old patient with portal hypertension and bleeding esophageal varices excluding endoscopy.
- O. Insertion of Swan-Ganz catheter.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: General surgery

Service/Procedure

- P. Hospital visit 3 days post uncomplicated cholecystectomy.
- Q. Abdominal hysterectomy for cancer in situ of cervix in a 50 year old woman.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: Internal medicine

Service/Procedure

- Std. Office visit, sore throat fever, and fatigue in a 19 year old college student (established patient).
- A. Management of a patient in acute pulmonary edema in emergency room who subsequently is admitted to hospital (established patient).
- B. Follow-up visit of a 55 year old male for management of hypertension, mild fatigue, on beta blocker/thiazide regimen.
- C. An office evaluation of new onset right lower quadrant pain in a 32 year old woman (established patient).
- D. Hospital visit, day 3 post admission, 65 year old male with uncomplicated MI (myocardial infarction) (established patient).
- E. Rigid sigmoidoscopy (without biopsy) in office.
- F. Initial office evaluation of a 37 year old generally well male.
- G. ECG with interpretation in a 50 year old man.
- H. Hospital consultation for diagnosis/management of fever following abdominal surgery.
- I. Urinalysis with microscopic exam in office lab under M.D. supervision.
- J. Office visit, 48 year old male (new patient) with fatigue, sleeplessness, and possible depression.
- K. Phone consultation with patient at home (1:30 a.m.) re: new onset of belching, abdominal pain, and nausea in 62 year old man.
- L. Direct hospital admission of a 62 year old smoker (established patient) with COPD (chronic obstructed pulmonary disease) in acute respiratory distress.
- M. Scheduled nursing home visit to established patient with Organic Brain Syndrome.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: Internal medicine

Service/Procedure

- N. Office phone consultation regarding possible adverse drug reaction in established patient.
- O. One supervisory conference with visiting nurse for antibiotic therapy in patient with subacute bacterial endocarditis.
- P. Aspiration of synovial fluid from knee.
- Q. Consultation for a transfusion reaction in a patient with abrupt onset of fever and back pain.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: Radiology

Service/Procedure

- Std. An upper GI (gastrointestinal) series with KUB (kidneys, ureters, bladder) for unexplained epigastric pain.
- A. Bilateral carotid angiogram by catheter (complete procedure) in a 66 year old male with transient ischemic attacks.
- B. Chest x-rays for cough and weight loss, PA (posterior anterior) and lateral.
- C. Barium enema (double contrast, complete procedure) for occult GI (gastrointestinal) bleeding in a 55 year old male.
- D. Venography (complete procedure) for possible deep vein thrombosis of lower extremity.
- E. Lumbar spine x-rays, complete exam in an adult patient with low back pain.
- F. Pelvic ultrasound, complete, for possible tubal abscess.
- G. RUQ (right upper quadrant) ultrasound for episodes of possible biliary colic.
- H. Repeat bilateral mammogram for screening purposes in a 45 year old female with no unusual risk factors.
- I. Foot x-rays: complete exam for severe mid-foot pain, possible fracture.
- J. Elbow x-rays: complete exam for pain, tenderness.
- K. CT scan (computerized axial tomography) of abdomen (non-contrast, complete procedure) for retroperitoneal adenopathy in presence of pre-existing disease.
- L. Complete skull series for headaches in an adult.
- M. Fetal ultrasound for possible fetal abnormality, real time B-scan with image documentation.
- N. Bone density study, dual photon absorptiometry of spine for possible osteoporosis.

Table 11 continued

List of surveyed services and procedures used
in the pilot survey: Radiology

Service/Procedure

- O. Intravenous urography (complete procedure) in patient with ureteral colic.
- P. Hysterosalpingography (complete procedure) in 26 year old woman with infertility.
- Q. Complete abdominal series for question of bowel obstruction.

Table 12

Summary of RBRVS pilot sample physicians
after first phase of screening process by Center for Survey Research

Specialty	Number of random names from AMA list	Total dropped from sample	No listing	Reason for being dropped				Eligible sample after first phase
				Unpublished number, no other number located	Retired	Not in sample area	Repeated calls, no answer	
Total	500	104	63	21	5	2	13	396
Anesthesiology	149	46	24	14	2	2	4	103
General Surgery	111	11	8	2	1	-	3	100
Internal Medicine	120	21	14	1	1	-	5	99
Diagnostic Radiology	60	16	10	2	1	-	4	44
General Radiology	60	10	7	3	-	-	-	50

Table 13

Final summary of RERVS pilot sample physicians
after second phase of screening

Specialty	Sample from phase one	Reasons for being dropped							Eligible sample after second phase	
		Dropped at second phase	Not in sample area	Leave of absence, sabbatical	Not in medical specialty	Retired	Not 20 hours in patient care	Too specialized to answer questions		Pretest duplicate
Total	396	32	8	2	4	4	4	8	2	364
Anesthesiology	103	9	2	1	2	1	1	2	-	94
General Surgery	100	6	-	1	2	-	1	2	-	94
Internal Medicine	99	8	3	-	-	2	1	2	-	91
Diagnostic Radiology	44	3	1	-	-	-	-	2	-	41
General Radiology	50	6	2	-	-	1	1	-	2	44

Table 14

RRVS pilot survey field results and response rates by specialty

Specialty	Eligible sample	Reasons for noninterview				Completed interviews
		Noninterviews	Refusal	Illness	Unable to arrange interview after repeated calls	
Total	364 (100.0)	98 (26.9)	65 (17.9)	2 (0.5)	31 (8.5)	266 (73.1)
Anesthesiology	94 (100.0)	19 (20.2)	11 (11.7)	0 (0.0)	8 (8.5)	75 (79.8)
General Surgery	94 (100.0)	25 (26.6)	12 (12.8)	0 (0.0)	13 (13.8)	69 (73.4)
Internal Medicine	91 (100.0)	37 (40.7)	31 (34.1)	1 (1.1)	5 (5.5)	54 (59.3)
Diagnostic Radiology	41 (100.0)	6 (14.6)	5 (12.2)	0 (0.0)	1 (2.4)	35 (85.4)
General Radiology	44 (100.0)	11 (25.0)	6 (13.6)	1 (2.3)	4 (9.1)	33 (75.0)
Combined Radiology	85 (100.0)	17 (20.0)	11 (12.9)	1 (1.2)	5 (5.9)	68 (80.0)

NOTE: Number in parentheses represents percentage of eligible sample

Table 15

Group values of intra-service work: Anesthesiology

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.821	0.035	662	8.3%	a. Anesthesia for procedures on heart, with pump oxygenator (coronary artery bypass graft and/or cardiac valve) (41)
2.714	0.021	518	5.1	i. Anesthesia for repair of abdominal aortic aneurysm (68)
2.506	0.019	321	4.5	e. Anesthesia for total hip replacement (67)
2.373	0.017	236	4.0	c. Anesthesia for colectomy (70)
2.358	0.018	228	4.2	h. Anesthesia for open reduction and internal fixation of hip fracture (69)
2.328	0.016	213	3.7	d. Anesthesia for cholecystectomy (70)
2.310	0.033	204	7.9	l. An evaluation of 63 year old (ICU) patient in intensive care unit with diabetes and chronic renal failure who develops Adult Respiratory Distress Syndrome 36 hours post mitral valve replacement (57)
2.270	0.018	186	4.2	p. Anesthesia for transurethral resection of prostate (TURP) (69)
2.243	0.016	175	3.6	o. Anesthesia for modified radical mastectomy (70)
2.205	0.038	160	9.0	f. Insertion of a Swanz Ganz catheter (60)
2.199	0.027	158	6.5	k. Anesthesia for lens surgery (cataract extraction with or without insertion of prosthesis) (66)
2.148	0.024	141	5.6	m. A brachial plexus nerve block for upper extremity operation (70)
2.121	0.027	132	6.5	n. An injection of anesthetic substance, therapeutic, epidural (single epidural block for pain) (65)
2.081	0.029	121	7.0	q. A consultation for transfusion reaction in patient with abrupt onset of fever and back pain (63)
2.026	0.017	106	4.0	g. Anesthesia for knee arthroscopy (68)
1.895	0.019	79	4.6	b. Anesthesia for cystoscopy (70)
1.829	0.018	67	4.2	j. Anesthesia for dilation and curettage (D&C) of uterus (70)

Note: Standard service - anesthesia for inguinal hernia repair.

¹ Approximate standard error as a percentage of the geometric mean.

Table 15 continued

Group values of intra-service work: General surgery

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.767	0.024	585	5.7%	a. Esophagogastrectomy for esophageal carcinoma (50)
2.648	0.022	445	5.2	e. Low anterior resection for rectal carcinoma (63)
2.471	0.023	296	5.4	l. Parathyroidectomy for primary hyperparathyroidism in 50 year old woman (51)
2.420	0.022	263	5.1	g. Modified radical mastectomy (63)
2.392	0.023	247	5.5	q. Abdominal hysterectomy for cancer in situ of cervix in a 50 year old woman (35)
2.371	0.019	235	4.5	h. Cholecystectomy for cholelithiasis (63)
2.153	0.056	142	13.7	j. Emergency room evaluation of a 25 year old motorcycle victim with multiple trauma (62)
2.124	0.016	133	3.8	c. Appendectomy for acute abdomen with appendicitis (62)
2.091	0.065	123	16.0	n. Initial critical care management for a 65 year old patient with portal hypertension and bleeding esophageal varices excluding endoscopy (57)
1.883	0.061	76	15.1	i. Diagnostic bronchoscopy in a patient with suspected lesion (28)
1.860	0.046	72	11.3	o. Insertion of Swan-Ganz catheter (47)
1.697	0.057	50	14.1	m. Direct hospital admission, 45 year old female new patient with acute cholecystitis (63)
1.660	0.059	46	14.5	f. Office visit for preoperative evaluation of a patient with primary hyperparathyroidism (53)
1.597	0.058	40	14.4	d. Office evaluation of new right lower quadrant pain in a 32 year old woman established patient (62)
1.497	0.070	31	17.6	k. Phone consultation from patient at home (1:30 a.m.) regarding new onset of belching, abdominal pain, and nausea in 62 year old man (59)
1.353	0.033	23	7.8	b. Rigid sigmoidoscopy without biopsy in office (62)
1.233	0.059	17	14.7	p. Hospital visit 3 days post uncomplicated cholecystectomy (61)

Note: Standard service - An uncomplicated indirect inguinal hernia repair in a 45 year old male.

¹ Approximate standard error as a percentage of the geometric mean.

Table 15 continued

Group values of intra-service work: Internal medicine

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.714	0.031	518	7.3%	a. Management of a patient in acute pulmonary edema in emergency room, who subsequently is admitted to hospital (established patient) (52)
2.616	0.031	413	7.5	1. Direct hospital admission of a 62 year old smoker (established patient) with COPD in acute respiratory distress (50)
2.573	0.030	374	7.2	h. Hospital consultation for diagnosis/management of fever following abdominal surgery (51)
2.519	0.023	330	5.5	q. Consultation for a transfusion reaction in a patient with abrupt onset of fever and back pain (49)
2.486	0.029	306	7.0	j. Office visit, 48 year old male (new patient) with fatigue, sleeplessness, and possible depression (53)
2.434	0.028	272	6.7	c. An office evaluation of new onset right lower quadrant pain in a 32 year old woman (established patient) (53)
2.361	0.032	230	7.7	f. Initial office evaluation of a 37 year old generally well male (53)
2.285	0.042	193	10.2	e. Rigid sigmoidoscopy (without biopsy) in office (38)
2.263	0.032	183	7.5	d. Hospital visit, day 3 post admission, 65 year old male with uncomplicated MI (established patient) (53)
2.255	0.038	180	9.1	p. Aspiration of synovial fluid from knee (39)
2.248	0.044	177	10.8	k. Phone consultation with patient at home (1:30 a.m.) re: new onset of belching, abdominal pain, and nausea in 62 year old man (49)
2.185	0.027	153	6.5	b. Follow-up visit of a 55 year old male for management of hypertension, mild fatigue, on beta blocker/thiazide regimen (53)
2.125	0.043	133	10.4	m. Scheduled nursing home visit to established patient with Organic Brain Syndrome (49)
2.067	0.038	117	9.0	o. One supervisory conference with visiting nurse for antibiotic therapy in patient with subacute bacterial endocarditis (49)
2.029	0.051	107	12.5	n. Office phone consultation regarding possible adverse drug reaction in established patient (53)

Note: Standard service - An uncomplicated indirect inguinal hernia repair in a 45 year old male.

¹ Approximate standard error as a percentage of the geometric mean.

Table 15 continued

Group values of intra-service work: Internal medicine continued

Logarithm scale		Original scale	
Mean	Standard error of mean	Geometric mean	Standard error ¹
1.982	0.039	96	9.4%
1.683	0.039	48	9.3
		Service with number of physicians in parentheses	
		g. ECG with interpretation in a 50 year old man (51)	
		i. Urinalysis with microscopic exam in office lab under M.D. supervision (43)	

Note: Standard service - Office visit, sore throat fever, and fatigue in a 19 year old college student (established patient).

¹ Approximate standard error as a percentage of the geometric mean.

Table 15 continued

Group values of intra-service work: Radiology

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.853	0.034	713	8.3	a. Bilateral carotid angiogram by catheter (complete procedure) in a 66 year old male with transient ischemic attacks (54)
2.287	0.029	194	6.9	k. CT scan of abdomen (non-contrast, complete procedure) for retroperitoneal adenopathy in presence of pre-existing disease (53)
2.270	0.026	186	6.1	d. Venography (complete procedure) for possible deep vein thrombosis of lower extremity (60)
2.224	0.019	167	4.5	c. Barium enema (double contrast, complete procedure) for occult GI bleeding in a 55 year old male (61)
2.223	0.037	167	8.8	m. Fetal ultrasound for possible fetal abnormality, real time B-scan with image documentation (53)
2.095	0.040	124	9.6	p. Hysterosalpingography (complete procedure) in 26 year old woman with infertility (58)
2.092	0.020	124	4.7	o. Intravenous urography (complete procedure) in patient with ureteral colic (63)
2.044	0.029	111	6.9	g. RUQ ultrasound for episodes of possible biliary colic (55)
2.036	0.029	109	6.9	f. Pelvic ultrasound, complete, for possible tubal abscess (54)
1.933	0.029	86	6.8	h. Repeat bilateral mammogram for screening purposes in a 45 year old female with no unusual risk factors (63)
1.781	0.069	60	17.3	n. Bone density study, dual photon absorptiometry of spine for possible osteoporosis (25)
1.719	0.031	52	7.5	q. Complete abdominal series for question of bowel obstruction (63)
1.700	0.034	50	8.1	l. Complete skull series for headaches in an adult (63)
1.672	0.029	47	7.0	e. Lumbar spine x-rays, complete exam in an adult patient with low back pain (61)
1.505	0.034	32	8.2	b. Chest x-rays for cough and weight loss, PA and lateral (62)
1.447	0.033	28	7.9	i. Foot x-rays: complete exam for severe mid-foot pain, possible fracture (63)
1.441	0.033	28	7.8	j. Elbow x-rays: complete exam for pain, tenderness (63)

Note: Standard service - An upper GI series with KUB for unexplained epigastric pain

¹ Approximate standard error as a percentage of the geometric mean.

Table 16

Reliability of responses about work

Specialty	Reliability	
	Individual physician	Mean of sample of physicians
Anesthesiology	0.647	0.992
General Surgery	0.709	0.993
Internal Medicine	0.614	0.988
Radiology	0.740	0.994

Table 17

Intra-service group ratings of the dimensions of work (logarithmic scale): Anesthesiology

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	2.821	0.035	2.511	0.014	2.857	0.028	2.752	0.025	2.765	0.024	2.761	0.033
B	1.895	0.019	1.600	0.019	1.951	0.018	1.902	0.018	1.941	0.015	1.973	0.019
C	2.373	0.017	2.244	0.016	2.306	0.019	2.276	0.019	2.305	0.018	2.270	0.020
D	2.328	0.016	2.083	0.019	2.281	0.017	2.229	0.018	2.272	0.017	2.252	0.022
E	2.506	0.019	2.326	0.016	2.413	0.020	2.430	0.018	2.423	0.024	2.385	0.021
F	2.205	0.038	1.536	0.022	2.330	0.031	2.162	0.033	2.358	0.028	2.472	0.026
G	2.026	0.017	1.951	0.022	1.993	0.010	1.999	0.013	1.989	0.010	1.999	0.013
H	2.358	0.018	2.144	0.016	2.870	0.022	2.288	0.019	2.311	0.020	2.288	0.018
I	2.714	0.021	2.446	0.013	2.701	0.023	2.657	0.023	2.664	0.024	2.628	0.024
J	1.829	0.018	1.528	0.019	1.871	0.019	1.838	0.019	1.870	0.018	1.937	0.020
K	2.199	0.027	1.948	0.018	2.167	0.032	2.079	0.029	2.185	0.024	2.176	0.032
L	2.310	0.033	1.720	0.017	2.392	0.031	2.076	0.033	2.307	0.030	2.258	0.042
M	2.148	0.024	1.618	0.036	2.140	0.024	2.100	0.024	2.253	0.026	2.242	0.027
N	2.121	0.027	1.550	0.028	2.169	0.025	2.152	0.024	2.279	0.028	2.322	0.031
O	2.243	0.016	2.145	0.014	2.141	0.018	2.164	0.016	2.145	0.017	2.110	0.020
P	2.270	0.018	1.998	0.013	2.222	0.021	2.188	0.018	2.243	0.019	2.266	0.020
Q	2.081	0.029	1.571	0.021	2.186	0.025	1.941	0.030	2.088	0.033	2.099	0.038

Note: S.E. = standard error of geometric mean.

Table 17 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): General surgery

Service	Work		Time		Mental effort		Physical effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	2.767	0.024	2.380	0.015	2.714	0.027	2.734	0.026	2.756	0.024	2.772	0.030
B	1.353	0.033	1.030	0.035	1.390	0.043	1.309	0.041	1.306	0.034	1.464	0.064
C	2.124	0.016	1.634	0.021	2.090	0.020	2.081	0.017	2.088	0.015	2.102	0.022
D	1.597	0.058	1.383	0.023	1.904	0.057	1.333	0.054	1.590	0.052	1.651	0.075
E	2.648	0.022	2.214	0.015	2.538	0.027	2.617	0.025	2.617	0.023	2.600	0.028
F	1.660	0.059	1.490	0.025	2.020	0.053	1.430	0.065	1.764	0.061	1.582	0.065
G	2.420	0.022	2.030	0.018	2.306	0.029	2.363	0.022	2.384	0.021	2.256	0.035
H	2.371	0.019	1.865	0.022	2.310	0.024	2.322	0.022	2.358	0.019	2.391	0.024
I	1.883	0.061	1.523	0.025	1.982	0.057	1.782	0.057	1.900	0.050	1.921	0.063
J	2.153	0.056	1.788	0.039	2.338	0.045	1.996	0.061	2.169	0.048	2.337	0.057
K	1.497	0.070	1.012	0.036	1.793	0.059	1.367	0.059	1.540	0.056	1.821	0.069
L	2.471	0.023	2.089	0.019	2.458	0.025	2.350	0.031	2.511	0.021	2.511	0.029
M	1.697	0.057	1.590	0.030	1.892	0.053	1.532	0.057	1.725	0.050	1.699	0.062
N	2.091	0.065	1.905	0.031	2.247	0.050	1.952	0.056	2.112	0.051	2.239	0.059
O	1.860	0.046	1.470	0.028	1.869	0.065	1.817	0.044	1.904	0.043	2.156	0.040
P	1.233	0.059	1.019	0.028	1.391	0.057	1.146	0.050	1.258	0.050	1.283	0.063
Q	2.392	0.023	1.980	0.018	2.238	0.035	2.339	0.025	2.331	0.023	2.361	0.028

Note: S.E. = standard error of geometric mean.

Table 17 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Internal medicine

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	2.714	0.031	1.753	0.022	2.644	0.038	2.546	0.041	2.628	0.036	2.657	0.048
B	2.185	0.027	1.208	0.023	2.188	0.029	2.011	0.019	2.126	0.028	2.200	0.037
C	2.434	0.028	1.416	0.020	2.420	0.027	2.261	0.023	2.387	0.031	2.424	0.044
D	2.263	0.032	1.227	0.020	2.255	0.031	2.111	0.030	2.251	0.032	2.256	0.042
E	2.285	0.042	1.262	0.037	2.144	0.044	2.242	0.035	2.377	0.030	2.351	0.043
F	2.361	0.032	1.584	0.023	2.287	0.038	2.196	0.032	2.262	0.038	2.081	0.048
G	1.982	0.039	0.973	0.037	2.060	0.042	1.744	0.041	2.062	0.040	2.095	0.049
H	2.573	0.030	1.682	0.019	2.574	0.031	2.397	0.035	2.509	0.033	2.519	0.040
I	1.683	0.039	0.761	0.046	1.782	0.039	1.660	0.039	1.760	0.043	1.774	0.047
J	2.486	0.029	1.651	0.019	2.497	0.031	2.285	0.031	2.395	0.033	2.361	0.039
K	2.248	0.044	1.058	0.040	2.286	0.042	2.119	0.063	2.202	0.046	2.473	0.042
L	2.616	0.031	1.704	0.025	2.537	0.031	2.450	0.037	2.544	0.032	2.493	0.043
M	2.125	0.043	1.171	0.036	2.059	0.040	2.143	0.036	2.058	0.039	1.982	0.036
N	2.029	0.051	0.972	0.034	2.084	0.043	1.812	0.048	2.037	0.049	2.272	0.046
O	2.067	0.038	1.153	0.030	2.175	0.033	1.955	0.050	2.133	0.038	2.254	0.045
P	2.255	0.038	1.178	0.032	2.040	0.039	2.158	0.030	2.288	0.033	2.318	0.033
Q	2.519	0.023	1.582	0.022	2.468	0.028	2.334	0.037	2.448	0.032	2.489	0.040

Note: S.E. = standard error of geometric mean.

Intra-service group ratings of the dimensions of work (logarithmic scale): Radiology

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	2.853	0.034	1.932	0.026	2.648	0.042	2.677	0.038	2.757	0.029	3.057	0.062
B	1.505	0.034	0.603	0.060	1.810	0.036	1.222	0.037	1.581	0.039	1.351	0.082
C	2.224	0.019	1.377	0.027	2.123	0.018	2.194	0.020	2.123	0.018	2.224	0.021
D	2.270	0.026	1.454	0.027	2.108	0.023	2.162	0.025	2.163	0.029	2.472	0.035
E	1.672	0.029	0.825	0.051	1.774	0.027	1.369	0.044	1.631	0.036	1.379	0.076
F	2.036	0.029	1.146	0.042	2.046	0.028	1.885	0.050	2.118	0.028	1.492	0.071
G	2.044	0.029	1.109	0.042	2.058	0.025	1.904	0.052	2.115	0.028	1.441	0.082
H	1.933	0.029	1.065	0.035	2.069	0.030	1.611	0.048	2.034	0.029	1.595	0.081
I	1.447	0.033	0.643	0.053	1.601	0.033	1.262	0.037	1.524	0.036	1.244	0.061
J	1.441	0.033	0.648	0.057	1.597	0.033	1.253	0.037	1.514	0.036	1.249	0.069
K	2.287	0.029	1.355	0.040	2.330	0.029	1.780	0.062	2.288	0.028	1.801	0.081
L	1.700	0.034	0.831	0.053	1.775	0.036	1.405	0.046	1.729	0.039	1.396	0.083
M	2.223	0.037	1.328	0.036	2.253	0.034	2.078	0.031	2.259	0.046	1.496	0.097
N	1.781	0.069	1.120	0.068	1.801	0.057	1.421	0.079	1.803	0.058	1.487	0.072
O	2.092	0.020	1.338	0.040	2.032	0.021	1.884	0.031	2.017	0.020	2.481	0.033
P	2.095	0.040	1.334	0.036	1.970	0.031	2.057	0.035	2.065	0.035	2.296	0.042
Q	1.719	0.031	0.849	0.059	1.807	0.028	1.431	0.043	1.693	0.031	1.444	0.084

Note: S.E. = standard error of geometric mean.

Table 18

Intra-service group ratings of the dimensions of work (untransformed scale): Anesthesiology

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	662	8.3%	324.3	3.2%	719	6.7%	565	5.8%	577	7.8%	582	5.7%
B	79	4.6	39.8	4.5	89	4.2	80	4.2	94	4.4	87	3.5
C	236	4.0	175.4	3.7	202	4.5	189	4.4	186	4.8	202	4.3
D	213	3.7	121.1	4.4	191	4.1	169	4.2	179	5.3	187	4.1
E	321	4.5	211.8	3.8	259	4.7	269	4.2	243	5.0	265	5.6
F	160	9.0	34.4	5.2	214	7.3	145	7.8	296	6.2	228	6.6
G	106	4.0	89.3	5.3	98	2.3	100	3.0	100	3.1	97	2.2
H	228	4.2	139.3	3.8	741	5.1	194	4.5	194	4.3	205	4.6
I	518	5.1	279.3	3.1	502	5.5	454	5.5	425	5.6	461	5.6
J	67	4.2	33.7	4.6	74	4.5	69	4.5	86	4.6	74	4.3
K	158	6.5	88.7	4.2	147	7.6	120	7.0	150	7.6	153	5.8
L	204	7.9	52.5	4.0	247	7.3	119	7.9	181	10.2	203	7.0
M	141	5.6	41.5	8.6	138	5.7	126	5.8	175	6.3	179	6.1
N	132	6.5	35.5	6.6	148	6.0	142	5.8	210	7.3	190	6.6
O	175	3.6	139.6	3.2	138	4.1	146	3.8	129	4.6	140	4.1
P	186	4.2	99.5	3.1	167	4.9	154	4.3	185	4.8	175	4.5
Q	121	7.0	37.2	4.9	153	6.0	87	7.2	126	9.1	122	7.9

Note: S.E. = approximate standard error as a percentage of the geometric mean.

Intra-service group ratings of the dimensions of work (untransformed scale): General surgery

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	585	5.7%	239.9	3.4%	518	6.5%	542	6.2%	592	7.0%	570	5.6%
B	23	7.8	10.7	8.3	25	10.4	20	9.8	29	15.8	20	8.1
C	133	3.8	43.1	5.1	123	4.7	121	4.1	126	5.3	122	3.6
D	40	14.4	24.2	5.5	80	13.9	22	13.3	45	18.8	39	12.8
E	445	5.2	163.7	3.5	345	6.3	414	5.9	398	6.7	414	5.4
F	46	14.5	30.9	6.0	105	13.0	27	16.2	38	16.2	58	15.0
G	263	5.1	107.2	4.3	202	7.0	231	5.2	180	8.4	242	4.8
H	235	4.5	73.3	5.1	204	5.6	210	5.2	246	5.7	228	4.5
I	76	15.1	33.3	6.0	96	13.9	61	13.9	83	15.7	79	12.2
J	142	13.7	61.4	9.3	218	11.0	99	15.0	217	14.1	148	11.7
K	31	17.6	10.3	8.8	62	14.6	23	14.6	66	17.3	35	13.7
L	296	5.4	122.7	4.6	287	6.0	224	7.4	324	6.9	324	5.0
M	50	14.1	38.9	7.2	78	13.0	34	13.9	50	15.4	53	12.2
N	123	16.0	80.4	7.4	177	12.1	90	13.9	173	14.5	129	12.6
O	72	11.3	29.5	6.6	74	16.2	66	10.6	143	9.6	80	10.5
P	17	14.7	10.4	6.7	25	14.0	14	12.2	19	15.6	18	12.3
Q	247	5.5	95.5	4.2	173	8.5	218	6.0	230	6.8	214	5.6

Note: S.E. = approximate standard error as a percentage of the geometric mean.

Table 18 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Internal medicine

Service	Work		Time		Mental effort		Physical Effort		Technical skill		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
A	518	7.3%	56.6	5.1%	441	9.2%	352	9.9%	454	11.8%	425	8.5%
B	153	6.5	16.1	5.6	154	7.0	103	4.4	158	8.8	134	6.7
C	272	6.7	26.1	4.8	263	6.5	182	5.5	265	10.5	244	7.4
D	183	7.5	16.9	4.8	180	7.4	129	7.1	180	10.1	178	7.7
E	193	10.2	18.3	9.0	139	10.6	175	8.4	224	10.4	238	7.2
F	230	7.7	38.4	5.5	194	9.1	157	7.6	121	11.7	183	9.1
G	96	9.4	9.4	9.0	115	10.2	55	9.8	124	12.0	115	9.7
H	374	7.2	48.1	4.4	375	7.3	249	8.3	330	9.6	323	8.0
I	48	9.3	5.8	11.1	61	9.4	46	9.4	59	11.5	58	10.5
J	306	7.0	44.8	4.5	314	7.3	193	7.4	230	9.4	248	7.9
K	177	10.8	11.4	9.5	193	10.2	132	15.7	297	10.1	159	11.1
L	413	7.5	50.6	5.9	344	7.4	282	8.9	311	10.5	350	7.6
M	133	10.4	14.8	8.6	115	9.6	139	8.6	96	8.7	114	9.4
N	107	12.5	9.4	8.3	121	10.4	65	11.8	187	11.1	109	11.9
O	117	9.0	14.2	7.1	150	7.9	90	12.2	179	10.9	136	9.1
P	180	9.1	15.1	7.7	110	9.3	144	7.1	208	8.0	194	7.9
Q	330	5.5	38.2	5.3	294	6.8	216	8.9	308	9.7	281	7.6

Note: S.E. = approximate standard error as a percentage of the geometric mean.

Intra-service group ratings of the dimensions of work (untransformed scale): Radiology

Service	Work			Time			Mental effort			Physical Effort			Technical skill			Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	
A	713	8.3%	85.5	6.2%	445	10.1%	475	9.1%	1140	15.3%	571	7.0%					
B	32	8.2	4.0	14.7	65	8.7	17	8.9	22	20.9	38	9.4					
C	167	4.5	23.8	6.4	133	4.3	156	4.7	167	5.0	133	4.3					
D	186	6.1	28.4	6.3	128	5.4	145	5.9	296	8.3	146	6.8					
E	47	7.0	6.7	12.6	59	6.5	23	10.7	24	19.1	43	8.7					
F	109	6.9	14.0	10.3	111	6.6	77	12.2	31	17.7	131	6.6					
G	111	6.9	12.9	10.3	114	5.9	80	12.7	28	20.7	130	6.6					
H	86	6.8	11.6	8.3	117	7.1	41	11.6	39	20.5	108	7.0					
I	28	7.9	4.4	13.0	40	7.9	18	9.0	18	15.2	33	8.6					
J	28	7.8	4.4	13.9	40	7.9	18	9.0	18	17.3	33	8.7					
K	194	6.9	22.6	9.7	214	7.0	60	15.4	63	20.6	194	6.7					
L	50	8.1	6.8	12.9	60	8.7	25	11.1	25	21.1	54	9.3					
M	167	8.8	21.3	8.7	179	8.1	120	7.5	31	25.1	182	11.1					
N	60	17.3	13.2	16.9	63	14.0	26	19.9	31	17.9	64	14.2					
O	124	4.7	21.8	9.8	108	5.1	77	7.5	303	7.8	104	4.8					
P	124	9.6	21.6	8.6	93	7.5	114	8.5	198	10.1	116	8.3					
Q	52	7.5	7.1	14.7	64	6.7	27	10.4	28	21.2	49	7.5					

Note: S.E. = approximate standard error as a percentage of the geometric mean.

Table 19

Predicting group ratings of work from the
group ratings of the five dimensions
(significance level of regression coefficient in parentheses)

Regression coefficients	Anesthesiology	General Surgery	Internal Medicine	Radiology
Time	0.3641 (0.0005)	0.0852 (0.1966)	0.1971 (0.2359)	0.4178 (0.0040)
Skill	1.2741 (0.0001)	0.1393 (0.4859)	0.2764 (0.2484)	0.1038 (0.6172)
Physical effort	-0.4008 (0.0735)	0.5899 (0.0002)	0.3237 (0.0151)	0.1560 (0.0456)
Mental effort	0.0387 (0.3863)	0.2472 (0.0384)	0.2085 (0.2243)	0.4689 (0.0097)
Stress Due to Risk	-0.2131 (0.3758)	-0.0291 (0.6097)	0.1172 (0.4798)	0.0096 (0.8025)
Constant	-0.0516 (0.4544)	0.0068 (0.8720)	-0.0352 (0.8749)	0.0692 (0.4676)
R ²	0.9940	0.9986	0.9899	0.9958

Table 20

Residual sums of squares from analysis of covariance:
Individual physicians ratings of work

	Anesthesiology	General Surgery	Internal Medicine	Radiology
A. Total	100.78	305.07	105.69	181.42
B. Physicians	89.76	258.99	62.21	161.57
C. Dimensions and services	19.34	45.43	22.48	32.22
D. Physicians and services	27.38	64.29	27.78	36.71
E. Physicians, services, and dimensions	15.59	27.68	14.83	22.48
A-D	73.40	240.78	77.91	144.71
D-E	11.79	36.61	12.95	14.23

Table 21

Regression coefficients from analysis of covariance "E" in table 20
(level of significance in parentheses)

	<u>Anesthesiology</u>	<u>General Surgery</u>	<u>Internal Medicine</u>	<u>Radiology</u>
Time	0.1307 (0.0001)	0.0089 (0.8114)	0.1996 (0.0001)	0.1036 (0.0001)
Skill	0.3106 (0.0001)	0.4258 (0.0001)	0.2193 (0.0001)	0.2653 (0.0001)
Physical Effort	0.1768 (0.0001)	0.1996 (0.0001)	0.2140 (0.0001)	0.1279 (0.0001)
Mental Effort	0.2634 (0.0001)	0.1080 (0.0002)	0.1589 (0.0001)	0.2852 (0.0001)
Stress Due to Risk	0.0211 (0.4386)	0.1323 (0.0001)	0.1186 (0.0001)	0.0037 (0.4823)

Table 22
Predicting group ratings of work

Specialty	R-squared	
	Five predictors	Composite predictor
Anesthesiology	0.9940	0.2241
General Surgery	0.9986	0.8138
Internal Medicine	0.9898	0.6454
Radiology	0.9958	0.5984

Chapter 5

National Survey: Service and Procedure Work

5.1 National RBRVS Survey

5.1.1 National Survey Physician Sample

As indicated earlier, there were 18 specialties to be surveyed for the national survey. For 17 of these specialties samples were again drawn from the AMA Physician Masterfile, as described in Chapter 4. (Oral and Maxillofacial Surgery is not covered by the AMA.) Identical to the sampling techniques used in the AMA's Annual Surveys, samples for the national survey were drawn to be representative of all nonfederal physicians who spend the greatest portion of their time (more than 20 hours per week) in patient care activities. We included both office and hospital-based physicians, but excluded residents.

In addition to limiting physician samples to nonfederal patient care physicians who have completed their residency programs, the following additional exclusions were made:

- Doctors of Osteopathy.
- Graduates of foreign medical schools who are only temporarily licensed to practice in the United States.
- Physicians for whom no current address is available.
- Physicians over 65 years of age.
- Physicians who were included in the pilot survey.

The sample design utilized for the RBRVS project is a stratified random sample with systematic selection from the listing of eligible physicians of the AMA Physician Masterfile. Stratification is used to assure the representativeness of the sample.

The sampling criteria are defined by the 17 specialty's groups, ten geographic regions of approximately equal size, and physician board certification. The specialty information used in the AMA Masterfile reflects physician's self-designated practice specialty. The geographic regions designed by AMA parallel the country's nine census divisions with some minor modifications. These modifications are discussed in the AMA's Socioeconomic Characteristics of Medical Practice, 1987 (AMA, 1987). For most specialties, strata were weighted to over-represent board certification. The board certification criteria used for the RBRVS national samples are presented in Table 23.

Physicians selected for the RBRVS national survey are representative of their specialty group and geographic region in the same proportion as their representation in the full nonfederal patient care physician population. Within these sampled groups, physician selection has been weighted by the board-certification criteria presented in Table 23.

5.1.2 Interviewer Training and Supervision

CSR was again contracted to carry out the telephone interviews. Interviewer training and supervision for the pilot survey was previously in Section 4.3.3. Interviewers again received extensive training to prepare them for the survey. This included no less than three and one-half days of interview training, testing, and review similar to that described above for the pilot survey.

As a standard part of interviewer quality control at CSR, at least one interview conducted by an interviewer each day was monitored by a supervisor to assure that study protocols were being followed and good interviewing techniques were being employed. In addition, for each interviewer, two completed interview schedules were reviewed each day to be certain that question objectives were being met. Supervisors would meet with interviewers immediately after carrying out these reviews to discuss any problems.

Interviewers were instructed to read only the material in the questionnaire. Copies of the questionnaires are shown in Appendix I. However, in some instances, physicians would raise various questions about the purpose of the survey or the content of the survey. Following the pilot survey, a list of the most frequently asked questions was compiled and a fact sheet developed. A copy of the fact sheet is attached in Table 24. When questions arose that related to answers on the fact sheet, interviewers were instructed to respond with these answers.

5.1.3 National RBRVS Survey Sample Size

The results of the pilot study were used to decide how many physicians should be included in the national survey. We used the familiar fact that the standard error of the mean of a sample of n observations is $\sigma/\sqrt{n}$, where σ is the standard deviation of the population from which the sample is drawn. Within each specialty, the pilot study provided for each service an estimate

of the standard deviation of the population from which were drawn the physicians' ratings of the work the service required (i.e., the population of logarithms of their numerical judgments about work). Most of those estimates were between 0.2 and 0.35; so we estimated that if there were a sample of size 50 from each specialty in the national survey, most of the standard errors of the mean ratings of work would be between $0.2/\sqrt{50}$ and $0.35/\sqrt{50}$ -- i.e., most would be between 0.028, which corresponds to seven percent on the scale of unlogged judgments of work, and 0.049, which corresponds to 12 percent.

We supposed errors of that magnitude would be overridden by the mismatches we would encounter when we tried to combine judgments from different specialties into a cross-specialty scale of work, and so it appeared that samples of size 50 would be adequate. Nevertheless, we decided to be cautious and take a sample of about 100 physicians from each specialty.

5.1.4 National RBRVS Survey Response Rates

CSR was contracted to deliver a minimum of 100 completed surveys in each specialty with a minimum response rate of 60 percent in each specialty. Although the sampling criteria discussed above indicated that we could sample a lower number of physicians and still get valid and reliable results, we felt interviews with 100 physicians would strengthen the study's credibility and integrity. Moreover, a larger sample size would

support cross analysis of the results by different demographic and socioeconomic characteristics.

We again prescreened physician samples in a two phase process. First, calls were made to office staff to confirm mailing addresses and survey criteria. Second, when interviewing the physician, they were again screened to insure that they met survey guidelines. Given a 60 percent minimum response rate per specialty and a minimum of 100 completed interviews per specialty, the final sample size per specialty needed to be approximately 167 physicians.

We knew from the pilot study, however, that in the second phase of screening, when interviewers reviewed the survey criteria directly with the physician, approximately 10 percent of the sample would still not meet the survey criteria. Therefore, our final sample needed to be approximately 185 physicians to insure that the 60 percent response rate per specialty and 100 survey minimum completed questionnaires per specialty could be met.

Initially, the physician samples sent by the AMA contained samples of more than 185 physicians. Therefore, simple random samples of the AMA list of physicians were drawn and numbered in ascending order. The first 185 physicians were selected and prescreened to insure that each surveyed physician:

- Was an active member of the surveyed specialty.
- Practiced patient care at least 20 hours per week.
- Was not in a residency training program.

- Had a valid telephone number.

If a physician failed to meet the survey criteria, he was replaced by the next higher numbered physician from the specialty's list. This process continued until the interviewing staff identified 185 eligible physicians.

Because telephone numbers were an important part of eligibility criteria, extensive efforts were made to obtain telephone numbers for every surveyed physician. Specific presurvey steps to obtain telephone numbers included:

- Calling directory assistance to locate numbers;
- Calling State Medical Boards; and
- In smaller communities, contacting local area hospitals.

Physicians were only dropped because of unavailable phone numbers if all of the above steps failing in obtaining a valid phone number.

Table 25 reports the results of the initial screening effort and the overall sample size needed to obtain our eligible sample. In general, as shown in the table, psychiatry and the specialties that are hospital-based (anesthesiology, diagnostic radiology, and pathology) required the largest sample to locate 185 eligible physicians with phone numbers.

Each physician remaining in the sample after the initial presurvey screening was sent a package of materials that included:

- A letter from the principal investigators at Harvard describing the purpose of the study and asking for cooperation;
- A letter from the American Medical Association urging cooperation;
- A description of the magnitude estimation method to be used in the survey;
- A list of services that physicians would be asked to rate; and
- A description of the dimensions physicians would be asked to rate.

A sample copy of these materials is attached in Appendix J.

During the second phase of the screening process, when CSR placed calls directly to the physicians to arrange interviews, the sample was further reduced. The results of the second phase of the screening process are shown in Table 26. Of the physician sample, 164 physicians, or 4.9 percent of the sample, were dropped after the second screening phase. The primary reason for dropping physicians at this stage was that they were not comfortable rating at least half of the services on the list. Seventy-five of the 3,328 physicians, or 2.3 percent of the initial sample, were dropped after the second phase of screening for this reason. The other major reason for excluding physicians in the second phase of screening process was that they did not practice physician care at least 20 hours per week. There were

61 physicians, or 1.8 percent of the initial sample, who were dropped in the second phase of screening for this reason.

The final eligible sample used in the national survey is also presented in Table 26. The eligible sample ranged from a low of 165 physicians in thoracic and cardiovascular surgery to a high of 183 physicians in oral and maxillofacial surgery.

Also reported in Table 26 is a summary of the number of interviews and response rates for each specialty in the national survey. Overall, 1977 interviews were completed from the eligible sample of 3,164 physicians, a 62.5 percent response rate. All specialties, except obstetrics and gynecology, had a response rate that fell between 60 and 69 percent. The response rate for obstetrics and gynecology was 55.9 percent. It is of interest to note that the active summary of physicians in the specialty of obstetrics and gynecology which did not respond to the survey had been called, on average, 36 times in an effort to complete an interview. Moreover, all physicians who initially refused to be interviewed were again recontacted by a different interviewer and asked to reconsider their decision.

5.2 Work Within a Service

The analyses of the judgments about intra-service work and its dimensions are nearly the same as the analysis of the judgments of intra-service work from the pilot survey. The primary difference in the national survey data is that instead of five dimensions of work, there are now four: time; mental

effort and judgment; technical skill and physical effort; and stress due to risk. We combined technical skill and physical effort into one dimension for the national survey, as explained in Chapter 3. This allowed us to increase the number of services about which the physicians were asked to make judgments to approximately 22 per specialty. In the following discussion, we again use "rating" to mean the common logarithm of the physicians' numerical judgment of work or of one of the dimensions of work. The analysis described here was performed 18 times, once for each specialty surveyed.

5.2.1 The Use of Logarithms

Before the numerical judgments of work and its dimensions were analyzed, each judgment from each physician was again transformed by taking its logarithm to the base 10. As indicated in Section 4.4.1, the logarithmic transformation was chosen because it aided the statistical analysis and permitted the usual statistical assumptions about population means and variances.

5.2.2 Policy About Outliers and Dropping Physicians

Aberrant ratings were identified in the same way as in Section 4.4.2. We again examined the full set of ratings given by a specialty. Deviant responses were deleted one by one until no response differed from the mean of the remaining ratings by more than three standard deviations of the remaining ratings.

Deleted ratings were considered outliers and treated as missing. Overall, 1.1 percent of the ratings were treated as missing data due to these outlier cuts. For the national survey, we dropped physicians from the sample for which more than 50 percent of the judgments were missing (not 45 percent as was used in the pilot sample). Table 27 reports the final number of physicians remaining in the sample after these deletions. A detailed discussion of the analytical files for the national survey is presented in Appendix K.

5.2.3 Group Ratings of Work Required by a Service

A specialty's array of work for the national survey can be defined as in the discussion of the pilot survey, Section 4.4.3. That is, a specialty's ratings (the logarithms of their numerical judgments of work) can be laid out in a table in which there was a row for each physician and a column for each service. This table will be referred to as the array of ratings of work. A few of the ratings in the array are missing because physicians did not always feel comfortable rating some of the services and because a few outliers had been deleted.

Because of the missing ratings, we again used the Estimation-Maximization algorithm (Dempster, Laird, and Rubin, 1966; Little and Rubin, 1987) to get summary statistics from the work array. Imagine a large work array that had a row for every physician in the specialty and no missing ratings. The

Estimation-Maximization routine that we used (Orchard and Woodward, 1972) provided an estimate of the mean of each column of the large array and an estimate of the standard deviation of each of those columns.

An approximate estimate of the standard error of the population mean was obtained by simply dividing the estimate of the standard deviation by the square root of the number of physicians from whom there were non-missing ratings of the work the service required. As noted before in Section 4.4.3, this estimate of the standard error tends to be a little too large.

Table 28 show the resulting estimates of the means and their standard errors. Each row shows for one of the services: in the first column, the estimate of the mean of the population of ratings; in the second column, the estimate of the standard error of that mean; in the third column the antilogarithms of the estimate of the mean (labelled "Geometric Mean"); in the fourth column, an approximate estimate, expressed as a percentage (see below) of the standard error of that antilogarithm; and in the final column, an abbreviated description of the service, and in parentheses, the number of non-missing ratings in the corresponding column of the array of ratings of work. At the bottom of the table is a brief description of the service the physicians were asked to use as the standard -- i.e., as requiring 100 units of work. The standard therefore stands at 2.0 on the logarithmic scale of ratings.

In interpreting these tables, it is helpful to note again that the antilogarithm shown in the third column is an estimate of the geometric mean of the population of unlogged judgments of the work the service requires. Its approximate standard error is shown in the fourth column: to be explicit, if the entry in the second column is a , the entry in the fourth is

$$100 \cdot (10^a - 1).$$

To the extent that the population of ratings is indeed normal, the fourth column provides 68 percent confidence limits on the geometric mean of the population of unlogged judgments; for example, if the geometric mean is 250 and the entry in the fourth column is 7.0, then 68 percent confidence limits on the geometric mean of the population of unlogged judgments of work are approximately $250/1.070$ and 250×1.07 . This follows from the fact that 68 percent of the members of a population with a normal distribution lie no further than one standard deviation from the mean.

It is also helpful to remember that when the population of ratings of work is symmetric (as it tended to be), the median and the geometric mean of the population of unlogged judgments of work are equal to each other.

5.2.4 Reliability of Ratings of Work

For each specialty, the reliability of the individual physician's ratings of work and the reliability of the mean ratings for the group were computed exactly as in the pilot

study. As discussed earlier in Section 4.4.4, the reliability of the ratings of work is a measure of their reproducibility. Within a specialty, it indicates how well individual physicians agree, and how well the results obtained from our sample would agree with the results from another sample of similar size.

Reliabilities were estimated by the method of intraclass correlation (Winer, 1971, pp. 283-287). The estimates were made specialty by specialty. Because some of the entries in the array of ratings of work were missing, the mean squares that enter into the computation of the intraclass correlation were obtained by a procedure that takes account of missing values (Snedecor and Cochran, 1980). This procedure does not treat missing values in the same way the Estimation Maximization procedure does, but it is customarily used in the computation of intraclass correlations.

The intraclass correlation for each specialty is shown in Table 29 in the column headed "Individual Physician." Although reporting intraclass correlations is customary in psychology, they are not so meaningful here as are the reliabilities shown in Table 29 in the column headed "Mean of Sample of Physicians." Each of these new reliabilities was obtained from the intraclass correlation by the Spearman-Brown prediction formula (Winer, 1971, p. 286).

To understand meaning of this new reliability, suppose that two samples of physicians, both of the same size as our sample, were drawn from the population of physicians, and that there were

no missing ratings in either sample; and suppose that in each sample, the means of the ratings were computed for each of the individual services. The reliability in the final column of the table is a prediction, again approximate, of what the correlation between the two sets of means would be. The results in Table 29 indicate that two samples of physicians would agree extremely well in their mean ratings of work.

Here again, the reliabilities are slightly higher than they would have been if aberrant responses had not been treated as missing. As before, reliabilities are reported mainly because it is customary, not because they are necessarily relevant to the primary purposes of the survey. Again, the consistency analysis in the next section provides more direct evidence that the group ratings of work obtained are reliable.

5.2.5 Consistency Between the Group Ratings of Work and the Group Ratings of the Dimensions

It is possible that even though two samples of medical experts would agree, they might be wrong. That possibility was explored by asking whether the ratings of the work required by different services can be predicted from the ratings of the other dimensions of the service.

The analysis was again done one specialty at a time. We first constructed an array which we refer to as the array of the ratings of the dimensions. It includes all the ratings that the physicians in the specialty gave for the dimensions of each

service. Assuming for illustrative purposes that there are 25 services, then there is a row for each of the physicians in the sample, and there are four times 25 columns. The first 25 are the ratings of time. The next 25 are the ratings of technical skill and physical effort, mental effort and judgment, and stress due to risk. Like the array of ratings of work, it has some missing entries.

We have already explained that the Estimation-Maximization procedure was used to obtain for each of the columns of the array of ratings of work, an estimate of the mean of the population from which the ratings in the column were drawn. As in the pilot study, the Estimation-Maximization procedure was now applied to the array of ratings of the dimensions, and it provided for each column of that array an estimate of the mean of the population from which the ratings in the column were drawn. These estimates are shown in Table 30 we also show these estimates on the untransformed scale in Table 31 for comparison.

For each of the services, we therefore had five estimates of population means: an estimate for work, and an estimate for each of the four dimensions. The question was whether the estimate for work could be predicted from the estimates for the dimensions.

Within a specialty, multiple linear regression was used in an attempt to predict the group ratings of work from the group ratings of the dimension, just as in the pilot study. The results are shown in Tables 32 and 33. (For the moment, ignore

the lines in Table 32 that are labelled "composite.") The regression coefficients in Table 33 are shown only for completeness. Better estimates of the parameters that those coefficients estimate will be shown later.

As in the pilot study, the values of R^2 shown in Table 32 (or Table 33) are remarkably close to unity, and are evidence that the group ratings of work are trustworthy. As explained in the discussion of the pilot study, they show that: magnitude estimation produced group ratings of work that are reliable; the dimensions were successfully chosen (although there are now four instead of five); that the ratings of work and its dimensions are consistent in a way that strongly suggests they are all realistic -- i.e., valid.

5.2.6 Consistency Within the Ratings of Individual Physicians

To see whether an individual physicians' rating of the work a service required was consistent with his or her ratings of the dimensions of the service, an analysis of covariance was done within each specialty in the way described in Section 4.4.6.

Technically, the analysis of the data from a specialty was again an analysis of covariance with two factors: physician and service. Each cell was the intersection of a row and column of the array of ratings of work. The dependent variable was the rating of work; so each cell contained at most one observation of the dependent variable, and a few of the cells were empty.

Associated with each non-missing value of the dependent variable were the values of four covariates--i.e., the corresponding ratings of time, technical skill and physical effort, mental effort and judgment, and stress due to risk.

A few of the values of the covariates were missing. Here again, they were estimated by what is known in BMDP (Dixon, Brown, Engelman, 1983) as the "regression" method of estimating missing values: the estimates used the statistics obtained by applying the Estimation- Maximization procedure to the array of ratings of the dimensions -- an array that was described earlier. Empty cells were handled by the method of least squares -- i.e., by using multiple linear regression with dummy variables that distinguished between physicians and between services.

In this analysis we have three kinds of predictive information: the identities of the physicians (the dummy variables that distinguish between physicians); the identities of the services (the dummy variables that distinguish between services); and the physician's ratings of the dimensions (the covariates). Table 34 summarizes, specialty by specialty, the results obtained when those kinds of information are used singly or in various combinations. Each row summarizes an analysis in which one or more of the kinds was used: an asterisk indicates the use of the kind of information in whose column the asterisk appears. Each row divides the total degrees of freedom (one less than the number of values of the dependent variable) into two parts: the residual degrees of freedom (error), and the others

(model). It also divides the total sum of squares (sum of squares of the deviations of the values of the dependent variable from their mean) into two parts in the analogous way. The R^2 is, of course, the ratio of the model sum of the squares to the sum of the model sum of the squares and the error sum of the squares.

Table 35 shows, specialty by specialty, what the regression coefficients of the dimensions (i.e., the weights of the covariates) are when Model 7 (see Table 34) is used. The values of R^2 are copied from Table 34. Table 36 is like Table 35 except that the model is Model 5. Both tables will be discussed later.

Most of the information in Table 34 is displayed only for completeness. Our main concern here is with the residual (i.e., error) sums of squares from Models 4 and 7. The residual sum of squares from Model 4 is the sum of the squares of the physician-by-service interactions. As explained in discussing the results of the pilot study, each of those interactions can be described as the deviation of a physician's rating of the work a service requires from the group norm. The difference between the interaction sum of squares and the residual sum of squares from Model 7 is shown at the foot of each section of the table (labelled "Interaction SS not accounted for): this difference is that part of the sum of squares of the interactions for which the corresponding interactions in the ratings of the dimensions account. As in the pilot study, each of these differences is significantly different from zero far beyond the 0.1 percent

level, and each is a non-trivial fraction of the interaction sum of squares.

Thus, as in the pilot study, a physician's deviation from the group norm in his or her rating of the work a service requires is, to some extent, consistent with his or her deviations from the group norms in ratings of the dimensions of the service. Here again, it is difficult to escape the conclusion that the ratings are realistic and that deviations from the group norms occur because there are real differences in the way in which physicians within a specialty practice medicine.

5.2.7 Are There Alternative Explanations for the Consistency?

Unless some alternative explanation for the consistency described in Section 5.2.5 and 5.2.6 can be found, we are forced to conclude that the ratings of work are consistent with the ratings of its dimensions because the ratings are all realistic. As in the pilot study, only one plausible alternative has been proposed: as we look at one service after another within a specialty, we might find that the rating of work and the ratings of the dimensions tend to move up and down in unison for some reason that has nothing to do with their realism. A physician's judgments of work and its dimensions might unconsciously influence each other, or they might all be influenced by the customary fee for the service.

That possibility was examined as in the pilot study. First, the group ratings of work within a specialty were

regressed on a single, composite predictor that was constructed as discussed in Section 4.4.7. The resulting values of R^2 are displayed in the "Composite predictor" column of Table 37. To their left are the corresponding values of R^2 from Tables 32 and 33. In every specialty, the difference between the R^2 obtained with the four predictors and the R^2 obtained with the composite is significant at the 0.1 percent level. The value for Psychiatry is in part due to one service, service E. As in the pilot study, we conclude that consistency in the mean ratings cannot be explained entirely by a tendency for the ratings to change in unison.

The same conclusion is reached by examining the significance levels of the regression coefficients shown in Table 33. As Section 4.4.7 explained, when one of these coefficients is significantly different from zero, it shows the consistency cannot be entirely explained by supposing that the ratings move up and down in unison. At least one of the coefficients of the dimensions is significantly different from zero in every specialty.

As in the pilot study, we reach a similar conclusion when we turn from mean ratings of work to the individual physicians' ratings. We had found that when a physician's rating of work deviates from the group norm, the deviation can to some extent be predicted from the way his or her ratings of the dimensions of the service deviate from the group norms. If that sort of consistency in individual's ratings could be explained entirely

by a tendency for ratings to move up and down in unison, then none of the regression coefficients in Table 35 would be significant except by chance. In every specialty, every coefficient is significant beyond the 0.001 percent level.

5.2.8 Comparing Coefficients from Different Specialties

Are these important differences between specialties in the regression coefficients of the ratings of the dimensions? It is difficult to answer by simply inspecting the coefficients shown in Table 33. In the first place, the regressions from which those coefficients were obtained are not the most precise procedures for estimating the parameters of which the coefficients are estimates. (Some better estimates will be considered in Section 5.2.9.) Second, and more important, the dimensions are positively correlated with each other, and because of the correlation, two sets of coefficients that look quite different may provide almost the same predictions of the mean ratings of work. Even when two specialties appear to have quite different coefficients, the differences may not be important. The efficient way to find out whether there are important differences between specialties is to see whether constraining the coefficients of the dimensions to be the same in all specialties produces an important degradation in the predictions. We therefore performed a multiple linear regression in which the value of the dependent variable was the mean rating of work that a service required, and the service's mean rating of

the four dimensions were the predictor variables. This time the number of values of the dependent variable was the total number of services in all specialties. The regression coefficients of the dimensions were constrained not to differ from specialty to specialty; but because the fifth parameter, the constant term in the regression equation, depends heavily on what service is used as the specialty standard, it was permitted to vary from specialty to specialty, using specialty dummy variables.

The results of the regression are summarized in the last row of Tables 32 and 33, the row labelled "All-specialty composite." The value of R^2 shown there is not as large as some of the 18 values for the individual specialties, but it is still quite close to unity. We conclude that except perhaps for differences in the constant term, which depends on the specialty standard, the relation between the rating of work and the ratings of its dimensions does not differ greatly from specialty to specialty.

For completeness, we did this composite regression three more times, once with only the specialties that Tables 32 and 33 list as medical, once with only those listed as surgical, and once with only the other three. The results are summarized in the rows labelled "composite medical," "composite surgical," and "composite other." Not surprisingly, all three values of R^2 are quite high. We conclude that within each of the three groups of specialties, the relation between the rating of work and the ratings of its components does not differ greatly from specialty

to specialty, except perhaps for differences in the constant term.

With enough data of high precision, it is sometimes possible to show that even differences too small to be interesting are statistically significant. Table 38 presents significance tests of the differences in the coefficients of the dimensions. The first F tests the differences within the group of medical specialties; the second, within the group of surgical specialties; the third, within the group of other specialties; and the fourth tests differences between the three groups. The third F is significant at the 5 percent level; each of the others, at the 0.1 percent level.

The main conclusion is that except perhaps for differences in the constant term, which are only to be expected, the relation between the mean rating of work and the mean rating of the dimensions does not differ greatly from specialty to specialty. This is a new kind of consistency, one that bridges specialties. It makes even more plausible the supposition that all five kinds of ratings are valid.

5.2.9 Values of the Regression Coefficients

Each of the regressions summarized in Tables 32 and 33 were performed mainly to assess a goodness of fit. All of them were therefore based on mean ratings, which are relatively free from random errors. If we had used individual physicians' ratings, the relatively large random errors to which they are subject

would have obscured the excellent fit. However, mean ratings do not provide precise estimates of the population values of the coefficients of the dimensions. Individual physicians' ratings provide estimates whose standard errors are much smaller. The coefficients in Table 36 are from a regression of individual ratings using Model 5 in Table 34. The regression controls for individuals but not services. The coefficients shown in Tables 33 and 36 are unbiased estimates of the same parameters of the population, but because those in Table 36 are based on individual ratings, they have smaller standard errors, and are therefore more likely to be worth examining carefully.

An examination of Table 36 does reveal a pattern that sheds light on the conclusion (see Section 5.2.8) that the four coefficients differ significantly from one group of specialties to another. The coefficients of the ratings of time seem to be higher in the medical specialties than in the surgical, and the coefficient of the rating of technical skill and physical effort seem to be lower. It is as if the medical specialists gave more weight to time in making their judgments about intra-service work, and the surgical specialists gave more weight to technical skill and physical effort. On the other hand, the two groups of specialties show no clear difference in the coefficient of mental effort and judgment, nor in the coefficient of stress due to risk.

5.3 Demographic Analysis

While these results appear quite impressive, these findings could be influenced by the representativeness of our samples. A number of important questions relate to the representation of the national sample and potential nonresponse bias. In this portion of the report we discuss the results of our analysis which addresses several of these issues.

5.3.1 Distribution of Sampled Physicians and U.S. Physician Population

In Table 39 we show the final distribution of board-certified physicians by specialty. As discussed earlier, we oversampled board-certified physicians in all but two specialties -- allergy and immunology, and rheumatology. As Table 39 reveals, the vast majority of our sample is board-certified. Internal medicine had the lowest portion of board-certified physicians with 75 percent reporting they were board-certified. Thoracic/cardiovascular surgery, with 90 percent board-certified, showed the highest percentage of board-certified physicians among the 18 specialties.

The distribution of sampled physicians by specialty and the nine geographic census regions is reported in Table 40. Also shown in Table 40 is the distribution of nonfederal patient-care physicians practicing in the U.S. Comparisons between the cells shows, in general, that our national sample reflects quite closely the distribution of nonfederal patient-care physicians in the U.S.. Most of the cells in the surveyed specialties are within a few percentages of U.S. population of nonfederal patient-care physicians.

5.3.2 Comparison of Respondents and Nonrespondents

How do the respondents to our national survey differ from those sampled physicians who did not respond? There are only two characteristics for which we have information available on our sampled nonrespondents which we use to compare with our respondents: board certification and geographic region.

Table 41 reports Chi-square values for board certification and geographic region by specialty for respondents and nonrespondents. Only one specialty, pathology, showed a significant difference at the 0.05 significance level when our sampled board-certified and nonboard-certified physicians were divided into respondents and nonrespondents. Similarly, when examining sampled respondents and nonrespondents regarding their geographic location, only one specialty showed a statistically significant difference from what might be expected: psychiatry.

The distributions of responder and non-responder physicians

by board certification and geographic region are similar for each of our specialties, with the two exceptions noted above. We can infer that response-non-response bias resulting from these two characteristics is not a problem in our data.

A more direct approach, however, for determining the effect of physician characteristics on intra-service work is to examine their impact using regression analysis. If selected physician characteristics, such as board certification, geographic location, and practice descriptors are not significant predictors of work, then it is unlikely that the question of respondent-non respondent bias is important.

5.3.3. The Effect of Physician Characteristics On Intra-Service Work

We performed multiple linear regression analysis to examine the effect of physician characteristics on work ratings. The dependent variable in the analysis was the logarithm of intra-service work and the predictors were selected physician characteristics and practice descriptors. We performed the analysis service by service, for each specialty. Each observation in the analysis or a service, was a specialty physician who rated the work of the service.

The predictors of work were: 1) board certification status; (2) whether the physician owned his or her practice or was paid on a fee-for-service basis; (3) years since graduation from medical school; (4) whether the hospital where the physician performs most of his or her hospital work has a residency training program; and whether the physician practices in (5) the Northeast, (6) the Midwest, (7) the South or (8) the West. The board-certification variable is 1 when the physician indicated that he or she was board certified, and 0 otherwise. The practice-ownership and fee-for-service variable is 1 when the physician reported being an owner of his or her practice, or being an employee who is paid on a fee-for-service basis; the variable is 0 otherwise. The residency-program variable is 1 if the physician reported that there is a residency program, 0 otherwise. The Midwest, South, and West variables are 1 if the physician practices in the indicated Census Bureau region, 0

otherwise. The Northeast variable was omitted to prevent perfect multi-collinearity. The results of this analysis are presented in Table 42.

Overall, our results indicate that physician characteristics and practice descriptors individually, and as a group, are not significant predictors of intra-service work ratings. We have noted with an asterisk statistically significant r-square values in table 5.20, based on an F-test of the model sum of squares, at the 5 percent level. Two asterisks denote statistical significance at the 1 percent level.

Statistical significance of the parameters on the independent variables, as measured by t-statistics, is similarly indicated with asterisks. Since the parameters for the regions are estimated relative to the Northeast, we applied an F-test of the explanatory power of a four-level categorical variable for region. Statistical significance of this construct is shown using asterisks in the columns of Table 42 labeled "Region."

When using hypothesis-testing repeatedly, it is not appropriate to take the $p < 0.05$ or $p < 0.01$ level of significance at face value. Samples of entirely random numbers can be expected occasionally to yield, by chance, patterns for which t-and F-test would indicate statistical significance. Given the multiple hypothesis testing (5 independent variables times 387 services yields 1,935 tests), the incidence of significant t-statistics that taken alone would indicate statistical significance is sufficiently low to support a

preliminary conclusion that our results are not sensitive to the characteristics of the physicians in our sample or the composition of our sample.

5.4 Comparison Between Pilot and National Survey Data

5.4.1 Reliability and Reproducibility

Another question fundamental to our study is the degree to which specialty physicians agree on their ratings of work. We first compared the ratings from the pilot survey with those from the national survey. There were only 52 services which were directly comparable between the two surveys. The results of these comparisons are shown in Table 43. In only three out of all possible comparisons were the t-statistics a test of differences between the mean pilot and the mean national study estimates of work or time significant beyond the 0.05 level. This finding implies that the ratings are reproducible, and that they were obtained by a reliable method.

In general, the ratings of work from the two independent studies produced results within 10 percent of each other. Only in few instances do they differ by more than 15 percent. The category of service that exhibited the greatest difference was evaluation and management. Estimates of time also agreed closely.

For internal medicine, we used different reference services in the two surveys. Thus, until we standardized them to a common service, ratings for the same service were not comparable. To align the two scales, we used the office visit of a 19-year-old established patient with a sore throat, fever, and fatigue. As Table 43 shows, the ratings for work for most services in internal medicine differed by less than 10 percent. Significant

differences appeared, however, in the ratings of work for services performed in the emergency room and by telephone consultation. The mean time estimates for most services were, again, surprisingly similar between the two surveys.

In general surgery, the mean ratings of work for all surgical procedures are similar between the two surveys; two-thirds of them are close to being the same values. There is also close agreement in the time estimates obtained from the two surveys.

The comparative results from the two surveys for anesthesiology and radiology parallel those for general surgery and internal medicine. Estimated times are not shown for anesthesiology because we changed the definition of anesthesia intra-service time between the pilot and national surveys.

We can also compare the reliability of the ratings of work from the two surveys reported in Sections 5.2.4 and 4.4.4. For convenience, these are shown in Table 44. As is shown in Table 44, the reliabilities for the four specialties are comparable for the two surveys.

5.4.2 Consistency and Validity

Tables 45 and 46 summarize the results of predicting work from its dimensions for the four specialties in the pilot and national surveys. These results were previously reported in Chapters 4 and Sections 5.2.5 and 5.2.6. The R-squares from the predictions using group ratings and individual data are comparable for the two surveys.

We further validated a major dimension of work by external objective information. We compared the durations of surgical procedures obtained from the national survey, which are based on physician recall, with the 1986 operating room logged times of eight hospitals from two regions of the United States. Table 47 compares the durations of several procedures that were identically defined and coded in the operating room logs and in our survey. The survey times are very similar to the operating room times, thus providing an external validation that physicians' judgments of time were realistic.

5.5 Unanswered Questions

We have already noted that analysis of the demographic information should be done using more refined methods. There are other questions that ought to be investigated if and when possible.

Non-responders - In every specialty, there were many physicians from whom no response was obtained, despite repeated efforts to reach them on the telephone. Would the specialty's values of intra-service work have changed importantly if the responses of those physicians could have been included? Fortunately, we have a record of the number of telephone calls needed to get a response from each physician who did respond (and the number of calls made to each physician from whom no response was obtained). It seems reasonable to regard physicians who never responded as extreme examples of the sorts of physicians who responded only after many calls; so it would be worthwhile to find out how the judgments of physicians who did respond were related to the number of calls needed to obtain their responses. That information, and the numbers of calls made to the non-responders could, in principle, be used to estimate how the specialty's values of intra-service work would have changed if the non-responders could have been included. If it appears that the difference between responders and non-responders is important, then additional research would have to be conducted to resolve this problem.

Distortion due to fees - Are physicians' judgments of intra-service work perhaps influenced by the fees now usually charged? One way to investigate that question is to find out whether the judgments of physicians who are paid by the service are more closely related to the usual fees than are the judgments of salaried physicians who are presumably not as conscious of the usual fees.

Fitness to rate - It has been suggested that physicians who perform a service rarely are not qualified to make judgments about it. It has been proposed that the physicians who responded to the survey be resurveyed to obtain their estimates of how often they perform each procedure. Those data may permit an examination of the relation, if any, between frequency of performance and judgment about work. However, frequency of performance does not necessarily represent the qualification to rate a service. Criteria such as specialty training to perform a service and how recently the physician performed the service may also have to be considered. Other researchers may wish to address these questions in the future.

Table 23

Board certification strata for RBRVS national survey sample

<u>Specialty</u>	<u>Percentage board certified</u>
Allergy/Immunology	not stratified
Anesthesiology	70
Dermatology	80
Family Practice	70
General Surgery	70
Internal Medicine	70
Obstetrics/Gynecology	70
Ophthalmology	80
Orthopedics	80
Otolaryngology	80
Pathology	80
Pediatrics	70
Psychiatry	70
Radiology	80
Rheumatology	not stratified
Thoracic/Cardiovascular Surgery	80
Urology	80

Table 24

Interviewer fact sheet for national survey

A. Who is doing the study?

The School of Public Health at Harvard University is funded for two and one half years by the Health Care Financing Administration to develop resource-based relative value scales for physician services. The study is being assisted by the American Medical Association and many of the specialties and subspecialties in organized medicine. The Center for Survey Research has been contracted by the School of Public Health to conduct the interviews.

B. What is the study about?

The study's purpose is to develop relative value scales based on the resources physicians incorporate in their work. The resource-based relative value scale inputs are:

- 1) time performing the service or procedure as well as pre- and post-time
- 2) complexity of the services and procedures being performed
- 3) an index of amortized value for specialty training
- 4) physician practice costs (including malpractice premiums)

C. Why are you asking me these questions?

You are being asked these questions to assist us in measuring time and complexity for these services and procedures.

D. Who developed the list of services and procedures?

The lists were developed by physicians in each specialty. These physicians, convened as technical consulting panels, were nominated by their respective specialty societies and the American Medical Association.

E. How did you get my name?

Your name was randomly drawn by the American Medical Association from their master file of physicians in the United States.

Table 24 continued

Interviewer fact sheet for national survey

F. How will the information be used?

The data we collect will be used to develop a resource-based relative value scale and may be one factor in determining reimbursement for specific services. The data and relative value scales will be used in discussions among different medical and surgical specialties. It may also be used by third-party payers and the government to develop and implement alternative payment systems.

G. The time involved in performing these services and procedures varies considerably: it depends whether I have help from residents. What time am I supposed to report?

Please report only your average time. Don't include other physicians' time or residents' time, just the average amount of time it would typically take you to perform the service or procedure.

H. What if I rarely or never perform the procedure?

If you rarely or never perform the procedure, please do not feel obligated to answer. Answer only for the services and procedures you feel comfortable rating.

I. How long will it take?

About one half hour.

J. Are my answers confidential?

Absolutely. Your answers will never be used in any way that could be linked to you or your individual household. They will be combined with answers from other interviews to make a statistical report.

K. Who is the interviewer?

The interviewer is a trained member of the staff of the Center for Survey Research at the University of Massachusetts.

L. When will the interview be conducted?

Now, or we would be glad to schedule it at a convenient time within the next two weeks.

Table 25

National physician survey: Initial screening results

Specialty	American Medical Association listings attempted	Not eligible	Sample not able to find phone #	Sample screened sample eligible
Total	3,722	214	180	3,328
Allergy/Immunology	206	12	9	185
Anesthesiology	220	16	19	185
Dermatology	193	6	2	185
Family Practice	209	14	10	185
General Surgery	206	10	11	185
Internal Medicine	214	14	15	185
Obstetrics/Gynecology	204	15	4	185
Ophthalmology	196	4	7	185
Oral and Maxillofacial Surgery	195	6	4	185
Orthopedics	197	6	4	185
Otolaryngology	199	4	10	185
Pathology	225	26	14	185
Pediatrics	210	15	10	185
Psychiatry	229	33	11	185
Diagnostic Radiology	213	15	14	184
Rheumatology	195	5	5	185
Thoracic/Cardiovascular Surgery	202	14	4	184
Urology	209	9	15	185

Table 26

National physician survey: Final RBRVS sample summary by specialty

Specialty	Sample size	Not an eligible respondent (NER)							Non-interviews				
		NER 6*	NER 7*	NER 8*	NER 9*	Other	Total not eligible for survey	Eligible sample size	Active survey not inter-viewed	Refusals	Other	Inter-views	Respon rate
Totals	3,328	13	75	61	8	7	164	3,164	424	760	3	1,977	62.5
Allergy/Immunology	185	-	2	2	-	-	4	181	23	45	-	113	62.4
Anesthesiology	185	-	2	1	-	1	4	181	47	17	-	117	64.6
Dermatology	185	-	1	8	-	-	9	176	7	62	1	106	60.2
Family Practice	185	1	4	3	-	1	9	176	13	53	-	110	62.5
General Surgery	185	2	4	4	1	2	13	172	16	51	-	105	61.0
Internal Medicine	185	4	4	5	2	1	16	169	15	51	-	103	60.9
Obstetrics/Gynecology	185	-	2	4	-	-	6	179	10	69	-	100	55.9
Ophthalmology	185	-	8	1	-	1	10	175	12	58	-	105	60.0
Oral and Maxillofacial Surgeons	185	-	-	2	-	-	2	183	36	29	-	118	63.8
Orthopedics	185	-	4	2	-	-	6	179	14	56	-	109	60.9
Otolaryngology	185	1	5	1	-	-	7	178	20	50	-	108	60.7
Pathology	185	1	3	4	2	-	10	175	53	3	-	119	68.0

Table 26 continued

National physician survey: Final RRRVS sample summary by specialty

Specialty	Sample size	Not an eligible respondent (NER)					Other	Total not eligible for survey	Eligible sample size	Non-interviews			Inter-views	Resp rate
		NER 6*	NER 7*	NER 8*	NER 9*	NER				Active survey not inter-viewed	Refusals	Other		
Pediatrics	185	1	5	8	-	-	-	14	171	25	41	-	105	61.4
Psychiatry	185	-	5	12	-	-	-	17	168	20	43	1	104	61.9
Radiology	184	1	7	3	1	-	-	10	174	36	18	-	120	69.0
Rheumatology	185	-	3	1	-	-	-	4	181	45	17	-	119	65.5
Thoracic/Cardiovascular Surgery	184	1	14	1	-	-	-	19	165	13	50	1	101	61.2
Urology	185	1	2	1	-	-	-	4	181	19	47	-	115	63.3

* NER6 = Physician is not in specialty listed

* NER7 = Physician cannot give informed ratings of at least half of procedures

* NER8 = Physician does not practice at least 20 hours per week

* NER9 = Physician is in residence

Table 27

Final number of physicians remaining in the sample
after missing-value deletions

Specialty	Number of physicians in sample
Allergy and Immunology	112
Anesthesiology	117
Dermatology	106
Family Practice	110
General Surgery	103
Internal Medicine	101
Obstetrics and Gynecology	89
Ophthalmology	98
Oral and Maxillofacial Surgery	117
Orthopedic Surgery	107
Otolaryngology	105
Pathology	115
Pediatrics	103
Psychiatry	100
Radiology	117
Rheumatology	119
Thoracic and Cardiovascular Surgery	96
Urology	115

Table 28

Group values of intra-service work: Allergy and immunology

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.708	0.024	510	5.6	R. Dir hosp adm of 62yo smoker, est pt, respiratory distress	(99)
2.694	0.021	494	5.0	E. Dir hosp adm, yng adlt pt, failed prev ther, asthmatic attack	(105)
2.604	0.021	402	5.0	L. Eval of 6yo M w mult infs, new pt	(109)
2.595	0.023	393	5.3	N. Init off eval of adlt w chronic recurrent hives, new pt	(112)
2.587	0.045	387	10.8	J. Inhalation bronchial challenge tstg w histamine, etc	(60)
2.576	0.021	376	5.0	F. Init ov for eval of child w chronic wheezing	(111)
2.574	0.026	375	6.3	A. Intracut, intradermal, tstts insects, immed react, 11-15 tstts	(103)
2.414	0.023	259	5.5	P. Med conf w pt. and/or family, counseling for avoidance, etc	(112)
2.393	0.053	247	12.9	I. Fibroscopic exam nasal, choanal, pharynx for nasal polyps	(40)
2.327	0.021	213	4.8	O. OV 45yo M, est pt, chronic asthma, on chronic steroid, etc	(111)
2.281	0.026	191	6.2	C. Percutaneous tstts w allergenic extracts (1st 30)	(101)
2.277	0.028	189	6.6	D. Intradermal tstts w allergenic extracts (1st 10)	(103)
2.255	0.034	180	8.1	K. Prof svcs for supervs and prov antigens, allergen immunother	(105)
2.198	0.029	158	7.0	M. A&R of intradermal tstts w antigens, immune deficiency eval	(101)
2.066	0.025	116	5.9	B. OV, est pt, 6yo child w sore throat and headache	(108)
1.966	0.029	92	6.9	H. Interp of pulm function tstts, interp results, FVC, FEV, FEF	(111)
1.816	0.039	65	9.5	Q. Interp of serum immunoelectrophoresis	(88)
1.667	0.039	46	9.4	G. 1x inj for immunother, antigen supp by another source	(103)

NOTE: Standard service - Follow-up ov for pharmacological mgmt of 30yo F w hay fever.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Anesthesiology

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.809	0.021	644	4.9	A. Anesth for CABG w pump oxygenator	(86)
2.727	0.018	533	4.3	K. Anesth for rep of AAA	(113)
2.658	0.020	455	4.6	T. Anesth for craniectomy or craniotomy	(102)
2.552	0.017	356	3.9	P. Anesth for carotid endarterectomy	(116)
2.496	0.017	313	3.9	D. Anesth for femoral-popliteal bypass	(116)
2.485	0.017	306	3.9	G. Anesth for total hip replmnt	(116)
2.428	0.016	268	3.7	C. Anesth for colectomy	(117)
2.386	0.015	243	3.5	J. Anesth for open reduction and int fixation hip fx	(116)
2.384	0.017	242	3.9	U. Anesth for cesarean section	(112)
2.324	0.014	211	3.3	F. Anesth for cholecystectomy	(114)
2.266	0.015	185	3.4	S. Anesth for modified radical mastectomy	(116)
2.257	0.015	181	3.5	O. Anesth for transurethral resection of prostate	(117)
2.242	0.026	175	6.1	N. Eval 63yo pt, ICU w diabetes and chronic renal failure, etc	(98)
2.187	0.023	154	5.5	M. Anesth for lens surgery, cataract extraction, etc	(111)
2.155	0.027	143	6.5	H. Insertion of Swan Ganz catheter	(100)
2.125	0.017	133	4.1	E. Anesth for laparoscopic tubal ligation	(109)
2.120	0.021	132	4.9	R. Inj of anesthetic substance, therapeutic, lx, epidural block	(115)
2.067	0.024	117	5.8	V. Consult for transfusion react in pt w fever and back pain	(107)
2.041	0.012	110	2.8	I. Anesth for knee arthroscopy	(112)
2.026	0.014	106	3.4	Q. Regional IV anesth for upper extremity op	(109)
1.883	0.021	76	5.0	B. Anesth for cystoscopy	(116)
1.834	0.017	68	4.1	L. Anesth for D&C of uterus	(116)

NOTE: Standard service - Anesth for inguinal hernia repair.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Dermatology

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.727	0.026	534	6.2	N. Excision & intermed rep ¹ of 4 by 6 mm BCE of forehead	30yo F (97)
2.569	0.026	371	6.1	M. C&E of 10 by 12 mm (BCE) of cheek of	60yo M (102)
2.558	0.026	361	6.3	U. Excision of 2 facial nevi, 20yo M, 8 and 4 nms respectively	(96)
2.542	0.024	348	5.6	A. Excision changing pigmented lesion back, 6x4 mm, 52yo M	(103)
2.527	0.022	337	5.1	P. Hosp consult, poss drug eruptions, 50yo M	(104)
2.474	0.019	298	4.4	T. Init comp eval 30yo F w symptoms of SCLE	(106)
2.411	0.020	258	4.8	R. Init off eval, adlt w chronic recurrent hives, new pt	(106)
2.354	0.038	226	9.0	S. Path gross and micro exam, melanocytic lesion, 26yo F	(58)
2.353	0.018	225	4.2	C. Init ov, eval and counseling 17yo F w primary genital herpes	(106)
2.349	0.046	224	11.1	I. Off revisit w est 63yo pt, laser tx hemangioma	(29)
2.330	0.017	214	4.1	J. Init ov, 16yo M w severe cystic acne, new pt	(104)
2.304	0.018	201	4.3	E. Init ov, 35yo M w complaint of alopecia	(106)
2.298	0.019	199	4.5	L. Shave/punch biopsy probable skin cancer	(101)
2.261	0.057	182	13.9	Q. X-ray ther, BCE tip of nose 65yo F, 1x tx, not entire course	(23)
2.154	0.028	142	6.6	B. Cryodest mult, 3 to 4, facial actinic keratoses, 65yo farmer	(100)
2.139	0.026	138	6.1	O. Liquid nitrogen cryodestruction 3 verrucae hands of 14yo M	(99)
2.052	0.033	113	7.8	D. Obtain specimen Tzanck Smear and interp of tst	(91)
2.035	0.033	108	7.9	K. Photochemother (PUVA), scheduled tx during ther	(54)
1.996	0.014	99	3.2	G. Off revisit for eval of 28yo M w onychomycosis	(105)
1.914	0.035	82	8.4	H. Obtain specimen for KOH slide and interp of tst	(102)
1.910	0.030	81	7.1	F. Intralesional inj, triamcinolone	(105)

NOTE: Standard service - Follow-up visit w 48yo M ongoing mgmt psoriasis not PUVA tx.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Family practice

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.922	0.052	836	12.6	G. Abdominal hysterectomy, cancer in situ of cervix, 50yo F (31)
2.758	0.039	573	9.3	H. Uncomplicated spontaneous vaginal delivery (68)
2.728	0.045	535	10.9	D. Appendectomy, acute abdomen w unperforated appendicitis (44)
2.599	0.019	397	4.6	T. Mgmt pt acute pulm edema in ER, subsequent hosp adm, est pt (104)
2.563	0.020	366	4.8	V. Emerg hosp consult, 72yo, new pt, w poss bowel obstruction (105)
2.539	0.018	346	4.2	A. Dir hosp adm yng adlt est pt, acute asthma attack (106)
2.479	0.018	301	4.3	U. Off consult psych exam 25yo M, intellect deterioration, etc. (104)
2.460	0.023	289	5.4	K. Init visit pregnancy 25yo primigravida, hx and exam, etc. (82)
2.361	0.019	230	4.5	S. NH visit, unsched, eval pt w fever and obtundation, etc. (105)
2.332	0.015	215	3.5	P. Off eval new onset right lower quad pain in 32yo F, est pt (109)
2.268	0.015	185	3.5	Q. Off eval 28yo pt regional enteritis, diarrhea, est pt (108)
2.261	0.022	182	5.3	E. Rigid sigmoidoscopy, wo biopsy, in off (89)
2.258	0.022	181	5.2	C. Rep of 2 inch laceration of scalp, 14yo M, off setting (108)
2.245	0.023	176	5.3	F. Incision & drainage of peri-anal abscess, off proc (103)
2.130	0.014	135	3.3	O. Ov 45yo M, est pt, chronic asthma, on chronic steroid, etc. (107)
2.115	0.017	130	4.1	N. Routine gyn exam, 24yo est pt, wo complaints (109)
2.070	0.024	118	5.7	R. Sched monthly NH visit to est pt w Organic Brain Syndrome (105)
2.064	0.018	116	4.2	W. Comp well child visit at 6 months, est pt (AAP guidelines) (108)
2.053	0.029	113	6.8	X. Phone consult, pt home, 1:30 A.M., belching, etc. (108)
1.966	0.025	93	5.9	Y. 1x supervs conf w nurse, antibiotic ther, est pt w SBE (101)
1.949	0.019	89	4.5	L. Ov, est pt, 6yo child w sore throat and headache (109)
1.880	0.022	76	5.3	M. Off eval, poss purulent conjunctivitis 16yo F, est pt (110)
1.772	0.022	59	5.3	B. Off revisit for eval of 28yo M w onychomycosis (108)
1.656	0.035	45	8.5	J. Obtain specimen for KOH slide and interp of tst (106)
1.547	0.032	35	7.7	I. Urinalysis w micro exam, off lab, supervs, excl collection (107)

NOTE: Standard service - Follow-up visit 55yo M, mgmt hypertension, beta/thiazide.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: General surgery

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.837	0.023	687	5.5	A. Tot esophagectomy w gastroesophageal anastomosis in chest	(70)
2.651	0.017	447	4.1	G. Low anterior resection for rectal CA	(101)
2.466	0.019	293	4.4	D. Modified radical mastectomy	(101)
2.406	0.021	255	4.9	L. Abdominal hysterectomy, cancer in situ of cervix, 50yo F	(58)
2.364	0.017	231	4.0	K. Cholecystectomy for cholelithiasis	(100)
2.112	0.049	129	12.0	Y. Triage, resus and hosp adm from ER, 52yo, alcoholic, etc.	(95)
2.111	0.039	129	9.3	J. Colonoscopy and polypectomy, 53yo M, etc., outpt	(55)
2.094	0.015	124	3.5	H. Appendectomy, acute abd w unperforated appendicitis	(102)
2.026	0.048	106	11.7	V. Init eval mgmt mult trauma pt w complex pelvic fx, 35yo M	(96)
2.020	0.026	105	6.3	E. Tracheostomy, emerg proc, transtracheal, in adlt, etc.	(97)
1.894	0.030	78	7.0	M. Decompression carpal tunnel, 48yo F, unilat, ambulatory surg	(60)
1.835	0.050	68	12.2	F. Tonsillectomy and adenoidectomy in 10yo child	(36)
1.778	0.044	60	10.5	W. Emerg hosp consult, 72yo, new pt, poss bowel obstruction	(103)
1.762	0.037	58	9.0	X. Insertion of Swan-Ganz catheter	(73)
1.731	0.040	54	9.7	N. Excision 0.5 cm basal cell CA, outer 1/3 lower eyelid	(81)
1.673	0.047	47	11.4	O. Preoperative eval new pt w primary hyperparathyroidism	(91)
1.610	0.040	41	9.6	T. Hosp adm, 45yo F w acute cholecystitis	(101)
1.588	0.026	39	6.2	B. Chest tube insertion for spontaneous pneumothorax in 20yo	(97)
1.543	0.045	35	10.8	P. Comp ov, init eval 48yo M recurrent low back pain to leg	(71)
1.491	0.041	31	9.9	S. Off eval new onset right lower quad pain in 32yo F, est pt	(102)
1.481	0.045	30	11.0	C. Regional IV anesth, upper extremity op, surg by other	(38)
1.365	0.029	23	6.8	I. Rigid sigmoidoscopy, wo biopsy, in off	(102)
1.225	0.044	17	10.7	R. Foll-up visit, post tx, pt w primary breast cancer	(102)
1.150	0.041	14	9.9	Q. Foll-up ov, 60yo est pt 8 weeks post partial colectomy, etc.	(102)
1.129	0.044	13	10.7	U. Hosp visit, 3 days post uncomplicated cholecystectomy, etc.	(101)

NOTE: Standard service - Uncomplicated indir inguinal hernia rep, 45yo M.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Internal medicine

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.721	0.020	526	4.6	A. Mgmt pt acute pulm edema in ER, subsequently adm hosp, est p	(101)
2.631	0.019	427	4.6	G. Emerg hosp consult, 72yo, new pt, w poss bowel obstruction	(100)
2.547	0.021	352	4.9	M. Dir hosp adm of 62yo smoker, est pt, respiratory distress	(100)
2.522	0.020	333	4.6	R. Hosp consult for diagnosis/mgmt of fever foll abdominal surg	(101)
2.459	0.018	288	4.2	K. Ov eval recent onset syncopal attacks, 70yo F, est pt	(101)
2.430	0.020	269	4.7	Q. NH visit, unsched, for eval pt w fever and obtundation, etc.	(94)
2.357	0.021	227	4.9	F. Init off eval, diagnosis and mgmt hematuria, etc.	(98)
2.337	0.019	217	4.4	L. Off eval 28yo pt regional enteritis, diarrhea, est pt	(100)
2.311	0.015	205	3.6	J. Off eval new onset right lower quad pain in 32yo F, est pt	(99)
2.219	0.027	165	6.4	D. Rigid sigmoidoscopy, wo biopsy, in off	(89)
2.215	0.027	164	6.3	T. Init off eval of a 37 generally well M	(101)
2.205	0.020	160	4.8	O. Hosp visit, day 3 post adm, 65yo M uncomplicated MI, est pt	(100)
2.193	0.022	156	5.3	S. Init eval and mgmt of recurrent urinary tract inf in F	(101)
2.180	0.028	151	6.7	W. Phone consult pt home, 1:30 A.M., belching, etc.	(100)
2.138	0.020	137	4.8	N. Foll-up hosp visit, day 2, pt non-dominant CVA, etc.	(100)
2.129	0.028	135	6.6	C. Aspiration of synovial fluid from knee	(93)
2.097	0.015	125	3.5	I. Ov 45yo M, est pt, chronic asthma, on chronic steroid, etc.	(100)
2.038	0.026	109	6.2	P. Sched monthly NH visit to est pt w Organic Brain Syndrome	(93)
2.016	0.028	104	6.8	X. 1x supervs conf w nurse, antibiotic ther, est pt w SBE	(95)
1.908	0.024	81	5.7	B. Ov, sore throat, fever, fatigue 19yo college student, est pt	(101)
1.898	0.023	79	5.5	H. Off eval, poss purulent conjunctivitis 16yo F, est pt	(100)
1.813	0.029	65	6.9	U. ECG w interp in a 50yo M	(100)
1.809	0.027	64	6.3	V. Off phone consult re: poss adverse drug react in est pt	(101)
1.546	0.031	35	7.5	E. Urinalysis w micro exam, off lab, supervs, excl collection	(84)

NOTE: Standard service - Foll-up visit 55yo M, mgmt hypertension, beta/thiazide.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Obstetrics and gynecology

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.732	0.028	540	6.6	V. Vaginal hysterectomy, anterior and posterior colporrhaphy	(88)
2.698	0.025	499	6.0	J. Abdominal hysterectomy, cancer in situ of cervix, 50 yo	(87)
2.639	0.038	435	9.1	H. Protracted labor req pitocin, etc., lx spent w pt	(86)
2.561	0.029	364	6.9	Q. Uncomplicated cesarean delivery, cephalopelvic disproportion	(88)
2.556	0.035	360	8.3	F. Labor, moderate hypertension, etc., lx spent w pt	(87)
2.507	0.038	321	9.1	G. Preterm labor, req tocolysis, etc., lx spent w pt	(86)
2.483	0.022	304	5.2	I. Ovarian cystectomy, unilateral, uncomplicated, in 25 yo	(88)
2.377	0.029	238	6.9	M. Uncomplicated spontaneous vaginal delivery	(89)
2.362	0.038	230	9.1	E. Normal uncomplicated labor, multipara, no risk, lx w pt	(88)
2.346	0.026	222	6.1	O. Laparoscopic tubal sterilization by fulguration in 35 yo	(81)
2.265	0.042	184	10.2	Y. Intracavitary radioelement app, pt w cervical cancer, etc.	(27)
2.179	0.032	151	7.6	W. Elective term 1st trimester pregnancy, evac and curettage	(49)
2.177	0.044	150	10.6	R. Fetal ultrasound poss fetal abnorm, B-scan w image doc	(58)
2.161	0.038	145	9.0	X. Init ov 34 year pt w primary infertility, incl counseling	(88)
2.089	0.037	123	9.0	S. Perf of amniocentesis at 16 weeks gestation	(68)
2.074	0.031	118	7.4	N. Colposcopy abnorm cervical cytology, Pap smear, w biopsy	(82)
2.065	0.038	116	9.1	C. Init visit pregnancy 25 yo primigravida, hx and exam, etc.	(89)
2.044	0.038	111	9.1	A. Init off eval secondary amenorrhea, 22 yo new pt, etc.	(88)
2.034	0.040	108	9.6	Z. Ov counseling 25yo primigravida, family hx of Downs Syndrome	(85)
2.011	0.037	103	8.9	L. Off eval new onset right lower quad pain in 32 yo F, est pt	(88)
1.947	0.036	88	8.6	U. Init ov eval and counseling 17 yo F w primary genital herpes	(87)
1.860	0.040	72	9.7	D. Ext foll-up prenatal visit at 36-37 weeks, etc.	(89)
1.777	0.034	60	8.0	K. Routine gyn exam, primary care phys, est pt, wo complaints	(88)
1.692	0.033	49	7.9	P. Ov postpartum care 6 weeks, uncomplicated vaginal delivery	(87)
1.607	0.037	40	8.8	T. Interp of fetal non stress tst	(88)
1.576	0.037	38	8.9	B. Limited prenatal foll-up visit, hx and exam, etc.	(89)

NOTE: Standard service - Diagnostic D&C for menometrorrhagia in 50 yo F.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Ophthalmology

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
3.406	0.043	2544	10.3	A. Penetrating keratoplasty, cataract extract and IOL implant	(71)
3.331	0.041	2143	10.0	M. Scleral buckle, w vitrectomy, primary	(61)
3.246	0.037	1764	8.9	J. Extracapsular cataract extract w IOL	(94)
3.151	0.032	1417	7.7	L. Glaucoma filtering proc, primary, trabeculotomy	(92)
3.095	0.034	1246	8.0	E. Secondary lens implant, w vitrectomy	(92)
3.045	0.028	1109	6.8	K. Commitant strabismus surg, primary, etc., in a child	(93)
3.045	0.048	1109	11.7	N. Panretinal photocoagulation, tot tx, one eye, etc.	(72)
3.028	0.066	1067	16.5	T. Refractive surg, radial keratotomy	(40)
2.965	0.030	923	7.2	I. Lid surg, two-lid blepharoplasty, both upper lids	(84)
2.820	0.036	660	8.5	U. Excision of 0.5 cm basal cell CA, outer 1/3 lower eyelid	(90)
2.382	0.032	241	7.6	O. Contact lens eval and fitting, incl comp eye exam, etc.	(88)
2.353	0.032	226	7.6	D. Consult/ext eval complex ophthalmic problem, etc.	(97)
2.323	0.030	210	7.0	Q. Fluorescein angiography diabetic retinopathy, etc., interp	(74)
2.304	0.029	201	6.8	H. Diagnostic ultrasonography eye ball w interp, B-Mode, etc.	(73)
2.162	0.031	145	7.3	G. IOL calculation, biometry/keratometry, A-mode	(90)
2.103	0.034	127	8.0	C. Comp eye exam, adlt pt w no specific complaints, hx, etc.	(97)
2.054	0.040	113	9.8	R. Endothelial cell count pre-op cataract surg	(58)
1.934	0.036	86	8.7	F. Interp formal visual fields tssts, neuro purposes, adlt	(95)
1.886	0.041	77	9.8	P. Interp of fundus photography	(86)
1.872	0.036	74	8.6	B. Foll-up exam, est pt, incl visual acuity, slit lamp, etc.	(98)
1.812	0.035	65	8.4	S. Off eval poss purulent conjunctivitis 16yo F, est pt	(96)

NOTE: Standard service - 1x chalazion proc, excision, left upper lid.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Oral and maxillofacial surgery

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
3.345	0.035	2213	8.3	A. LeFort 1 maxill and sagit split mandib osteotomies, etc.	(113)
3.120	0.033	1318	7.9	I. Bilat sagitt osteotomy, mandib ramus 20yo F, etc.	(113)
3.073	0.037	1183	8.8	W. Unilat menisceoplasty, temporomandibular joint	(102)
3.030	0.031	1071	7.3	Q. Open surgical tx, complex mandib fx, etc.	(117)
3.008	0.032	1018	7.8	T. Open tx, mult fx zygomatic arch and malar tripod, etc.	(114)
2.855	0.037	717	8.9	V. Placement of 4 maxill endosseous implants	(96)
2.838	0.046	689	11.1	U. Unilat arthroscopy of temporomandibular joint	(55)
2.719	0.028	523	6.7	P. Closed reduction mandib fx by manipulation, etc.	(117)
2.584	0.021	383	5.0	D. Remov 4 impact (full bony) wisdom teeth, 1x hosp proc, 21yo	(115)
2.571	0.031	372	7.3	O. Unilat Caldwell-luc proc, etc., w antral polyp remov	(104)
2.508	0.021	322	4.9	C. Remov 4 impact (full bony) wisdom teeth, 1x off proc, 21yo M	(115)
2.377	0.026	238	6.3	G. Extract 10 erupted mandib teeth, 60yo M on Persantine, etc.	(116)
2.217	0.031	165	7.4	M. Gen anesth, off extract 4 wisdom teeth healthy 18yo M, etc.	(96)
2.176	0.035	150	8.3	K. Comp eval 28yo F, 2 year hx facial/TMJ pain, etc.	(114)
2.162	0.035	145	8.3	N. Gen anesth for extract of fx tooth in 4yo child	(110)
2.146	0.026	140	6.1	E. Gen anesth 14yo child, expos 1 impacted cuspid, off setting	(106)
2.018	0.035	104	8.3	F. Gen anesth extract abscessed tooth in healthy 40yo M	(110)
1.918	0.035	83	8.5	S. Perf and interp bilat Xray TMJ, open and closed, etc.	(97)
1.910	0.023	81	5.5	J. Excision of 0.5 cm benign lesion of the lip in a 60yo F	(113)
1.760	0.026	58	6.2	H. Extract of abscessed tooth in a healthy 40yo M	(117)
1.753	0.030	57	7.1	L. Ov 45yo F smoker w small oral ulcer on lateral border tongue	(115)
1.469	0.026	29	6.2	B. Ov to advise remov wisdom teeth, 18yo M, etc.	(115)
1.467	0.028	29	6.6	R. Interp panoramic x-rays remov impacted wisdom teeth, etc.	(116)

NOTE: Standard service - Expos 1x impact cuspid, off, 14yo future ortho tx, etc.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Orthopedic surgery

Mean	Logarithm scale		Original scale		Service with number of physicians in parentheses
	Standard error of mean	Geometric mean	Standard error ¹		
2.892	0.022	780	5.1	A. Primary tot hip replacement for osteoarthritis	(104)
2.877	0.032	753	7.6	T. Laminectomy, decompression spinal cord, cauda equina, etc.	(85)
2.751	0.029	564	7.0	E. Unilat lumbar laminectomy, excision intervertebral disc, etc	(86)
2.665	0.025	462	5.9	F. Open reduction and int fixation, intertrochanteric fx 80yo F	(105)
2.466	0.023	292	5.5	D. Arthroscopic partial menisectomy, 22yo M, knee trauma, etc.	(100)
2.420	0.029	263	6.9	G. Reduction unstable closed comminuted fx distal radius, etc.	(100)
2.282	0.021	191	5.0	C. Bunionectomy, Keller/McBride/Mayo type, 45yo F, etc.	(102)
2.182	0.053	152	13.1	J. Init eval, mgmt mult trauma pt, complex pelvic fx, 35yo M	(104)
1.919	0.045	83	10.9	S. Perf and interp a lumbar myelogram, 68yo F	(68)
1.750	0.044	56	10.6	I. Comp ov, init eval 48yo man recurrent low back pain to leg	(104)
1.731	0.043	54	10.5	H. Comp init off visit for eval 13yo F w progressive scoliosis	(99)
1.582	0.041	38	10.0	M. Closed reduction, subluxation head radius, 4yo M, off settin	(102)
1.558	0.041	36	9.9	N. 1st visit eval and counseling 28yo M runner, knee/calf pain	(104)
1.451	0.044	28	10.7	K. Intermed ov, est pt known osteoarthritis and swollen knees	(106)
1.398	0.048	25	11.6	B. Day 3 or 4 post-op foll-up, 80yo F, rep intertrochanteric fx	(105)
1.377	0.036	24	8.8	R. Aspiration of synovial fluid from knee, off proc	(107)
1.345	0.056	22	13.8	O. Interp x-rays, tx comminuted fx distal radius, 3 views, etc.	(105)
1.272	0.052	19	12.8	L. Interp lumbar spine X-rays, complete radiograph exam, etc.	(103)
1.253	0.049	18	12.0	U. Interp hip x-rays, complete, for moderate/severe hip pain	(105)
1.204	0.051	16	12.5	Q. Interp foot x-rays, poss fx, complete radiograph exam, etc.	(106)
1.177	0.051	15	12.5	P. Interp elbow x-rays: complete radiograph exam, for pain, etc	(105)

NOTE: Standard service - Decompression carpal tunnel, 48yo F, unilat, ambulatory surg.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Otolaryngology

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
3.064	0.035	1160	8.5	Q. Acoustic neuroma resection in adlt, translabyrinthine (27)
2.987	0.019	970	4.5	A. Laryngectomy, w radical neck dissection for cancer in 65yo M (97)
2.842	0.055	694	13.5	P. Cochlear implant, child, bilat sensorineural hearing loss (19)
2.813	0.021	651	4.9	1. Parotidectomy, lateral lobe, dissection, etc. (97)
2.801	0.018	632	4.3	H. Tympanoplasty w mastoidectomy for cholesteatoma in adlt (99)
2.654	0.023	451	5.4	F. Septorhinoplasty, primary rhinoplasty septal rep, 25yo M (95)
2.390	0.023	245	5.3	O. Uvulopalatal pharyngoplasty, upper airway obstruction (76)
2.369	0.028	234	6.7	M. Tracheostomy, emerg proc, transtracheal, adlt, etc. (105)
2.317	0.017	207	4.1	T. Unilat Caldwell-luc proc, maxill sinus disease, polyp remov (104)
2.098	0.019	125	4.5	G. Dir laryngoscopy w biopsy, suspected CA, 50yo M, gen anesth (102)
2.080	0.023	120	5.4	E. Diagnostic fiberoptic bronchoscopy, bronchopulm lesion (84)
1.962	0.021	92	5.0	R. Closed reduction nasal fx, stabilization, post trauma 20yo M (103)
1.790	0.017	62	4.0	D. Bilateral tympanostomy tube insertion, etc., 2yo, gen anesth (104)
1.756	0.039	57	9.4	I. Eval recurrent dizziness and vertigo 48yo F, incl hx, etc. (105)
1.742	0.045	55	10.8	S. Rhinoplasty eval, 25yo F, incl hx, physical, etc. (95)
1.655	0.039	45	9.4	N. Eval hoarseness and dysphagia, 65yo M incl hx and physical (104)
1.627	0.033	42	7.8	C. Init off eval gradual hearing loss, 58yo M, hx, etc. (103)
1.577	0.030	38	7.1	U. Remov of foreign body from ear canal wo gen anesth (103)
1.443	0.043	28	10.4	K. Interp of spontaneous nystagmus tst, w recording (ENG) (89)
1.364	0.035	23	8.3	B. Ov, sore throat, fever, fatigue, 19yo college student, est p (104)
1.263	0.038	18	9.1	J. Interp of audiometry, basic, comp (103)

NOTE: Standard service - Tonsillectomy and adenoidectomy in 10yo child.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Pathology

Mean	Logarithm scale		Original scale		Service with number of physicians in parentheses
	Standard error of mean	Geometric mean	Standard error ¹		
3.029	0.032	1070	7.6	A. Exam of a tot laryngectomy etc., CA of larynx, etc.	(111)
2.728	0.033	534	7.8	C. Exam frozen section breast biopsy, 2-3 cm, 34yo F, etc.	(113)
2.716	0.027	521	6.3	J. Interp of fine needle aspirate of the prostate, 10 smears	(105)
2.712	0.027	515	6.4	M. Exam hysterectomy and salpingo-oophorectomy, 57yo F, etc.	(115)
2.711	0.028	514	6.5	I. Exam posterior cervical lymph node biopsy, 46yo M, etc.	(115)
2.692	0.031	492	7.4	O. Exam of a changing melanocytic lesion in a 26yo F	(113)
2.684	0.032	483	7.7	K. Consult in an intrapartum bleeding diathesis	(89)
2.606	0.032	404	7.7	N. Consult for transfusion react in pt w fever and back pain	(96)
2.562	0.027	365	6.5	L. Exam mult endoscopically remov biopsies, etc., pt w colitis	(115)
2.509	0.030	323	7.1	G. Cytologic exam of a bronchial aspirate	(113)
2.462	0.029	290	6.8	E. Exam acid fast stained slide, etc., lesion of lymph node	(115)
2.447	0.027	280	6.4	Q. Exam of D&C for bleeding in a postmenopausal F	(114)
2.227	0.032	169	7.5	H. Interp peripheral blood smear showing atypical lymphocytes	(109)
2.181	0.034	152	8.0	F. Interp of serum immunoelectrophoresis	(91)
2.157	0.029	143	7.0	R. Clinical path consult, ltd-crystal analysis synovial fluid	(109)
2.154	0.042	143	10.2	P. Interp of I/S ratio for fetal maturity	(82)
1.683	0.025	48	6.0	B. Exam two segments vas deferentia, etc., to induce sterility	(110)

NOTE: Standard service - Exam of a gall bladder removed for cholelithiasis.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Pediatrics

Logarithm scale		Original scale		Service with number of physicians in parentheses	
Mean	Standard error of mean	Geometric mean	Standard error ¹		
2.759	0.030	574.4	7.1	A. Attendance in delivery room w resus of 2000 gram infant	(90)
2.635	0.022	431.5	5.1	G. Hosp adm for 18 month old child w 10% dehydration	(103)
2.588	0.022	387.5	5.3	L. Poss of sexual abuse in 5yo F, new pt	(102)
2.501	0.029	317.3	7.0	K. Intubation of newborn	(90)
2.495	0.020	312.5	4.7	H. Init visit of adolescent F w abd pain, new pt	(101)
2.471	0.020	295.7	4.8	O. Foll-up visit, adolescent w behavior problem, etc., est pt	(101)
2.429	0.021	268.3	5.1	F. Comp well child visit at 15 years, new pt (AAP Guidelines)	(102)
2.428	0.026	268.0	6.2	N. Lumbar puncture of 5yo for suspected meningitis	(101)
2.417	0.018	261.2	4.3	S. Init ov for eval of child w chronic wheezing	(101)
2.380	0.021	240.0	4.9	I. Off eval head trauma, pre-school child w vomiting, est pt	(102)
2.371	0.020	235.0	4.7	E. Comp well child visit at 5 years, new pt (AAP Guidelines)	(102)
2.328	0.021	212.7	4.9	P. Rep of 2 inch laceration of scalp, 14yo M, off setting	(92)
2.271	0.018	186.6	4.3	D. Comp well child visit at 2 years, est pt (AAP Guidelines)	(102)
2.227	0.018	168.7	4.1	C. Comp well child visit at 6 months, est pt (AAP Guidelines)	(103)
2.192	0.025	155.7	5.9	U. Remov of foreign body from ear canal wo gen anesth	(101)
2.101	0.029	126.3	6.8	M. Closed reduction, subluxation, head of radius at elbow, 4yo	(93)
2.032	0.034	107.6	8.3	J. 2:00 A.M. phone call for crying child under 12 months	(102)
1.996	0.020	99.0	4.8	R. Off eval, poss purulent conjunctivitis 16yo F, est pt	(102)
1.801	0.029	63.3	6.9	Q. Urinalysis w micro exam, off lab, excl collection	(91)
1.778	0.025	60.0	5.9	T. Phone call during off hours for child w rash on Amoxicillin	(103)
1.743	0.020	55.4	4.6	B. Off eval of diaper dermatitis, est pt	(101)

NOTE: Standard service - Ov, est pt, 6yo child w sore throat and headache.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Psychiatry

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.893	0.020	781	4.7	Q. Eval 24yo M, murder, competency to stand trial, etc. (96)
2.545	0.024	351	5.7	A. ER eval, intervention 25yo M, voices, attempt stab, etc. (98)
2.479	0.022	301	5.2	V. Court-requested eval juvenile, attempted rape a 71yo F, etc. (96)
2.428	0.032	268	7.5	L. Hosp ER eval 78yo F, ingested alcohol and valium, suicide (98)
2.294	0.024	197	5.6	T. Ov family psychother, 38yo father incestuous w 12yo daughter (95)
2.257	0.023	181	5.5	J. Mult family group med psychother of families, in-pts, etc. (86)
2.256	0.026	180	6.1	M. Ov diag interview & eval 17yo M, personality change, etc. (99)
2.229	0.021	169	5.0	N. Off consult psych eval 65yo M, intellect deterioration, etc. (99)
2.185	0.025	153	6.0	W. Eval & level care decision 17yo adolescent, schizo, etc. (96)
2.184	0.013	153	3.0	D. Hosp consult, psych eval 68yo surg, post-op depression (99)
2.062	0.018	115	4.2	K. Group med psychother in-off, 6 pts seen weekly, etc. (87)
1.928	0.029	85	6.8	R. 1x supervisory conf, team RNs, SWs, andn MHWs, psych unit (98)
1.711	0.055	51	13.4	I. Family psychother, husband of 28yo F, bipolar illness, etc. (98)
1.651	0.022	45	5.1	S. Ov diag reeval 68yo F, chronic depression, unresponsive tx (99)
1.634	0.021	43	5.0	X. Prep report to DMH halfway house coord, 3-week hosp, etc. (93)
1.614	0.022	41	5.1	E. Eval records and reports, 69yo F, pre-syncope episodes, etc (97)
1.603	0.022	40	5.2	U. Ov individ psychoanalysis 42yo, passive-aggressive, etc. (91)
1.540	0.023	35	5.5	G. Ov, term 66yo business executive 2x weekly psychother, etc. (97)
1.485	0.020	31	4.8	P. Electroconvulsive ther, 1x seizure, 82yo widowed M hosp, etc (63)
1.385	0.025	24	5.9	C. Foll-up psychother ov, 48yo housewife for tx of agoraphobia (95)
1.987	0.015	97	3.6	H. Weekly med psychother and pharmacother ov, 36yo F, etc. (96)
1.848	0.024	71	5.6	O. Ov chemother for mgmt of 44yo M w bipolar depression (99)
1.748	0.021	56	5.0	F. Repeat hosp visit stabilized 42yo M, schizophrenia, etc. (99)
1.737	0.033	55	8.0	B. Phone conv, retarded mother of 18yo schizophrenic M, etc. (100)

NOTE: Standard service - 2nd ov after referral from internist, 25yo M panic attacks.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Radiology

Mean	Logarithm scale		Original scale		Service with number of physicians in parentheses
	Standard error of mean	Geometric mean	Standard error ¹		
2.893	0.020	781	4.7	A. Cervicocerebral angiography, selective catheter, etc.	(94)
2.545	0.024	351	5.7	H. Computerized tomography guidance needle biopsy, etc.	(89)
2.479	0.022	301	5.2	S. Perf & interp a lumbar myelogram, 68yo F	(105)
2.428	0.032	268	7.5	K. MRI spinal cord, incl spine, unexplained motor weakness, etc	(47)
2.294	0.024	197	5.6	G. Echography pregnant uterus, B-scan image doc, complete, etc.	(104)
2.257	0.023	181	5.5	N. Venography, unilat, complete proc, poss vein thrombosis, etc	(113)
2.256	0.026	180	6.1	F. Interp computerized axial tomography, abd, etc., cancer	(106)
2.229	0.021	169	5.0	E. Complete abd echography, B-scan, image doc, complete, etc.	(107)
2.185	0.025	153	6.0	R. Hysterosalpingography, complete proc, 26yo F w infertility	(98)
2.184	0.013	153	3.0	D. Barium enema, double contrast, complete proc, occult GI, etc	(116)
2.062	0.018	115	4.2	M. IV urography, pyelography incl kidneys, ureters, etc.	(115)
1.928	0.029	85	6.8	J. Interp mammography, bilat, for 50yo pt w pain in breasts	(112)
1.711	0.055	51	13.4	P. Interp bone density study, dual photon absorptiometry, etc.	(46)
1.651	0.022	45	5.1	Q. Interp lumbar spine x-rays, complete radiograph exam, etc.	(116)
1.634	0.021	43	5.0	L. Interp complete abd incl decubitus, etc., intest obstruction	(115)
1.614	0.022	41	5.1	C. Interp bilat rib x-rays, incl posteroanterior chest, etc.	(116)
1.603	0.022	40	5.2	O. Interp of complete skull series for headaches in an adult	(115)
1.540	0.023	35	5.5	T. Interp of hip x-rays, complete, for moderate/severe hip pain	(115)
1.485	0.020	31	4.8	B. Interp chest x-rays, 2 views, frontal & lateral, etc.	(115)
1.385	0.025	24	5.9	I. Interp rad exam ankle, complete, min 3 views, etc., fx	(115)

NOTE: Standard service - Upper GI series, air contrast technique, KUB abd pain, etc.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Rheumatology

Logarithm scale		Original scale		Service with number of physicians in parentheses
Mean	Standard error of mean	Geometric mean	Standard error ¹	
2.748	0.022	560	5.3	A. Init off eval; SLE, fever, seizures and thrombocytopenia (116)
2.726	0.023	532	5.6	K. Init off eval & mgmt pt, vasculitis and circulation (118)
2.652	0.020	449	4.8	D. Consult hosp, 35yo F, fever, swelling joints, rash, etc. (117)
2.540	0.020	346	4.7	C. Init off eval of 70yo F w polyarthralgia (117)
2.514	0.018	327	4.3	O. Comp init eval 48yo M recurrent back pain radiating to leg (115)
2.502	0.020	317	4.8	H. Init off eval pt, negative lab and x-ray studies, fibrositis (118)
2.325	0.019	211	4.4	J. Foll-up visit 40yo mother, Stage III, Class III, etc. (116)
2.209	0.019	162	4.5	M. Foll up off consult, 45yo M ankylosing spondylitis, etc. (117)
2.183	0.019	152	4.5	I. Foll-up visit 45yo, rheumatoid arthritis on gold, etc. (116)
2.019	0.021	104	4.9	N. Ltd ov, est pt known osteoarthritis and painful swollen knee (117)
2.002	0.028	101	6.6	E. Aspiration of synovial fluid from knee (117)
1.950	0.030	89	7.1	F. Perf & interp cell count, differential, etc., synovial fluid (102)
1.923	0.031	84	7.5	G. Inj corticosteroid prep into tendon sheath or trigger point (118)
1.798	0.047	63	11.4	L. Interp bone density study, dual photon absorptiometry, etc. (74)
1.663	0.028	46	6.6	Q. Interp of hip x-rays, complete, for moderate/severe hip pain (118)
1.646	0.029	44	7.0	B. Interp x-rays, hands, bilateral, acute rheumatoid arthritis (118)
1.390	0.033	25	8.0	P. Interp of sed rate, (ESR); Westergren type (116)
1.319	0.034	21	8.2	R. Interp of platelet count, Coulter counter (114)

NOTE: Standard service - Foll-up ov, etc., Stage II, Class II, rheumatoid arthritis.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Thoracic and cardiovascular surgery

Mean	Logarithm scale		Original scale		Service with number of physicians in parentheses
	standard error of mean	Geometric mean	Standard error ¹		
2.935	0.025	862	6.0	A. Redo CABGx3, 1st reop 68yo M, 3 yr post graft, etc.	(82)
2.788	0.030	613	7.1	S. Tot esophagectomy w gastroesophageal anastomosis in chest	(88)
2.781	0.025	604	5.9	D. Primary CABGx3, 65yo M, etc., no complicating assoc disease	(80)
2.780	0.027	603	6.4	T. Primary aortic valve repl 50yo F, prosth valve, etc.	(81)
2.742	0.034	552	8.1	P. Rep ventricular septal defect in 5yo child	(60)
2.709	0.029	512	6.8	I. Prosth graft repl 10 cm abd infrarenal aortic aneurysm, etc.	(81)
2.598	0.024	397	5.6	H. Left upper pulm lobectomy, for squamous bronchogenic ca	(91)
2.504	0.026	319	6.1	O. Carotid endarterectomy, unilat, 58yo F, hx ischemic attacks	(77)
2.288	0.037	194	8.9	Q. Insertion, mgmt, & remov balloon pump, post CABG, etc.	(85)
2.083	0.028	121	6.7	J. Mediastinoscopy in pt w suspected paratracheal lymph nodes	(92)
2.067	0.032	117	7.6	R. Tracheostomy, emerg proc, transtracheal, in adlt, etc.	(96)
1.844	0.033	70	8.0	G. Primary diag fiberoptic bronchoscopy, bronchopulm lesion	(92)
1.774	0.042	59	10.0	M. Init pericardiocentesis, 35yo M post chest trauma	(94)
1.666	0.045	46	10.9	K. Ext init off eval of 70yo F w increasing dysphagia	(92)
1.650	0.045	45	10.9	U. Eval 65yo M, chronic stable angina and coronary artery disease	(84)
1.632	0.045	43	10.8	F. Init hosp eval pulm tumor 45yo smoker, prev in good health	(95)
1.613	0.024	41	5.8	B. Chest tube insertion for spontaneous pneumothorax, in 20yo	(96)
1.602	0.047	40	11.5	N. Init off eval 50yo M w aortic aneurysm, to recommend surg	(89)
1.572	0.036	37	8.7	L. Thoracentesis, tot evac, effusion and suspected pulm tumor	(96)
1.436	0.055	27	13.4	E. Hosp visit, day 2 post-op, CABGx3, 65yo M, no assoc disease	(84)
1.099	0.047	13	11.5	C. Foll-up hosp visit, day 1 post-op chest tube insertion, etc.	(95)

NOTE: Standard service - Permanent single chamber cardiac pacemaker implantation, etc.

¹Approximate standard error as a percentage of the geometric mean.

Table 28 continued

Group values of intra-service work: Urology

Mean	Logarithm scale		Original scale		Service with number of physicians in parentheses
	Standard error of mean	Geometric mean	Standard error ¹		
3.419	0.033	2626	7.8	A. Tot cystectomy and ileal loop, urinary diversion, etc.	(112)
3.102	0.034	1264	8.1	L. Percutaneous nephrostolithotomy, 1 stage, 2 cm stone or less	(88)
2.998	0.027	995	6.5	H. Transurethral resection of prostate, TURP, etc., BPH 70yo M	(114)
2.994	0.040	985	9.6	M. Extracorporeal shock wave lithotripsy, etc., 2 cm renal ston	(65)
2.956	0.031	904	7.5	N. Ureteroscopy w remov of calculus	(112)
2.874	0.032	749	7.7	E. Insertion non-inflatable, semi-rigid, penile prosth, 60yo M	(100)
2.750	0.027	562	6.4	C. Fulguration and resection medium bladder tumor, 2-5 cm 65yo	(112)
2.706	0.034	509	8.2	T. Uncomplicated indirect inguinal hernia repair, 45yo M	(70)
2.673	0.039	471	9.4	K. Cystoscopic laser ther superficial bladder tumor, in hosp	(54)
2.437	0.026	274	6.2	U. Bilat vasectomy, incl post-op semen examinations	(98)
2.388	0.019	244	4.5	Q. Cystourethroscopy w insertion of indwelling ureteral stent	(110)
2.184	0.034	153	8.1	S. Init eval and mgmt of unexplained renal failure in a 40yo F	(107)
2.096	0.031	125	7.3	P. Cystometrogram calibrated electronic equipment, etc.	(99)
2.083	0.033	121	8.0	J. Init eval and mgmt of recurrent renal calculi in 40yo M	(114)
2.058	0.034	114	8.1	F. Init consult for infertility in 35yo M	(111)
2.014	0.012	103	2.8	I. Diag cystoscopy, off proc in M w microhematuria	(106)
2.001	0.032	100	7.6	O. Init eval and mgmt of recurrent urinary tract inf in F	(114)
1.984	0.034	96	8.3	G. Init off eval diagnosis & mgmt painless gross hematuria, etc	(114)
1.937	0.032	86	7.6	D. Off eval new onset right lower quad pain 32yo F, est pt	(112)
1.674	0.046	47	11.2	R. Semen analysis for infertility	(76)
1.577	0.036	38	8.7	B. Foll-up hosp visit 2 days post uncomplicated TURP in 70yo M	(109)

NOTE: Standard service - Diag cystoscopy hosp, ambulatory surg, M w microhematuria.

¹Approximate standard error as a percentage of the geometric mean.

Table 29

Reliability of ratings of intra-service work by specialty

Specialty	Number of physicians in sample	Reliability	
		Individual physician	Mean of sample of physicians
Rheumatology	119	0.810	0.998
Orthopedics	107	0.802	0.998
Otolaryngology	105	0.797	0.998
Oral & Maxillofacial Surgery	117	0.795	0.997
Thoracic/Cardiovascular Surgery	96	0.790	0.997
Radiology	117	0.784	0.998
Urology	115	0.778	0.998
Ophthalmology	98	0.776	0.997
Anesthesiology	117	0.720	0.997
General Surgery	103	0.717	0.996
Internal Medicine	101	0.713	0.996
Family Practice	110	0.698	0.996
Pediatrics	103	0.674	0.995
Obstetrics & Gynecology	89	0.651	0.994
Pathology	115	0.632	0.995
Allergy & Immunology	112	0.626	0.995
Dermatology	106	0.522	0.991
Psychiatry	100	0.522	0.991

Table 30

Intra-service group ratings of the dimensions of work (logarithmic scale): Allergy and immunology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.181	0.015	2.000	-	2.000	-	2.000	-
A	2.574	0.026	1.698	0.040	2.349	0.037	2.387	0.033	2.645	0.029
B	2.066	0.025	1.190	0.017	2.116	0.021	2.050	0.019	2.159	0.026
C	2.281	0.026	1.346	0.031	2.167	0.033	2.291	0.024	2.288	0.029
D	2.277	0.028	1.319	0.030	2.223	0.034	2.319	0.025	2.404	0.030
E	2.694	0.021	1.854	0.020	2.667	0.024	2.528	0.028	2.671	0.029
F	2.576	0.021	1.755	0.015	2.602	0.023	2.448	0.025	2.480	0.023
G	1.667	0.039	0.892	0.044	1.769	0.042	1.778	0.037	2.289	0.037
H	1.966	0.029	0.943	0.029	2.189	0.030	2.023	0.036	2.024	0.033
I	2.393	0.053	1.302	0.031	2.359	0.053	2.493	0.051	2.402	0.054
J	2.587	0.045	1.696	0.047	2.477	0.042	2.505	0.043	2.641	0.040
K	2.255	0.034	1.268	0.031	2.336	0.031	2.276	0.036	2.458	0.029
L	2.604	0.021	1.779	0.016	2.629	0.022	2.426	0.029	2.496	0.029
M	2.198	0.029	1.364	0.034	2.201	0.033	2.253	0.029	2.193	0.032
N	2.595	0.023	1.756	0.016	2.612	0.024	2.407	0.029	2.404	0.025
O	2.327	0.021	1.391	0.015	2.407	0.024	2.294	0.020	2.430	0.024
P	2.414	0.023	1.566	0.016	2.451	0.027	2.264	0.030	2.262	0.026
Q	1.816	0.039	0.864	0.036	2.064	0.041	1.907	0.043	2.042	0.043
R	2.708	0.024	1.890	0.020	2.677	0.027	2.550	0.025	2.696	0.033

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Anesthesiology

Service	Work			Time			Mental effort			Technical skill and physical effort			Stress due to to risk		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	S.E.
*	2.000	-	1.811	0.010	2.000	-	2.000	-	2.000	-	2.000	-	2.000	-	-
A	2.809	0.021	2.416	0.013	2.744	0.022	2.686	0.021	2.755	0.021	2.755	0.021	2.755	0.021	0.025
B	1.883	0.021	1.467	0.016	1.960	0.015	1.947	0.015	1.964	0.015	1.964	0.015	1.964	0.015	0.018
C	2.428	0.016	2.165	0.013	2.320	0.016	2.303	0.016	2.325	0.016	2.325	0.016	2.325	0.016	0.017
D	2.496	0.017	2.285	0.014	2.405	0.017	2.378	0.017	2.419	0.017	2.419	0.017	2.419	0.017	0.018
E	2.125	0.017	1.659	0.017	2.131	0.016	2.126	0.015	2.162	0.015	2.162	0.015	2.162	0.015	0.017
F	2.324	0.014	1.996	0.013	2.243	0.014	2.232	0.014	2.243	0.014	2.243	0.014	2.243	0.014	0.015
G	2.485	0.017	2.259	0.010	2.412	0.017	2.386	0.015	2.415	0.015	2.415	0.015	2.415	0.015	0.017
H	2.155	0.027	1.483	0.020	2.295	0.023	2.286	0.022	2.372	0.022	2.372	0.022	2.372	0.022	0.024
I	2.041	0.012	1.892	0.014	2.019	0.011	2.031	0.011	2.018	0.011	2.018	0.011	2.018	0.011	0.012
J	2.386	0.015	2.065	0.013	2.323	0.016	2.314	0.013	2.343	0.013	2.343	0.013	2.343	0.013	0.015
K	2.727	0.018	2.382	0.011	2.673	0.018	2.638	0.018	2.696	0.018	2.696	0.018	2.696	0.018	0.017
L	1.834	0.017	1.408	0.016	1.920	0.014	1.904	0.013	1.955	0.013	1.955	0.013	1.955	0.013	0.014
M	2.187	0.023	1.873	0.014	2.188	0.022	2.091	0.024	2.214	0.024	2.214	0.024	2.214	0.024	0.024
N	2.242	0.026	1.723	0.018	2.366	0.025	2.083	0.034	2.288	0.034	2.288	0.034	2.288	0.034	0.030
O	2.257	0.015	1.915	0.012	2.244	0.013	2.186	0.014	2.281	0.014	2.281	0.014	2.281	0.014	0.017
P	2.552	0.017	2.121	0.011	2.541	0.018	2.468	0.016	2.582	0.016	2.582	0.016	2.582	0.016	0.018
Q	2.026	0.014	1.787	0.020	2.031	0.015	2.052	0.017	2.101	0.017	2.101	0.017	2.101	0.017	0.020
R	2.120	0.021	1.547	0.020	2.166	0.019	2.202	0.019	2.290	0.019	2.290	0.019	2.290	0.019	0.021
S	2.266	0.015	2.085	0.010	2.158	0.015	2.151	0.014	2.168	0.014	2.168	0.014	2.168	0.014	0.014
T	2.658	0.020	2.375	0.017	2.614	0.019	2.574	0.018	2.636	0.018	2.636	0.018	2.636	0.018	0.021
U	2.384	0.017	1.908	0.011	2.395	0.017	2.337	0.017	2.494	0.017	2.494	0.017	2.494	0.017	0.020
V	2.067	0.024	1.565	0.020	2.210	0.024	1.977	0.026	2.188	0.026	2.188	0.026	2.188	0.026	0.030

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued
Intra-service group ratings of the dimensions of work (logarithmic scale): Dermatology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.016	0.022	2.000	-	2.000	-	2.000	-
A	2.542	0.024	1.330	0.024	2.391	0.032	2.575	0.028	2.607	0.030
B	2.154	0.028	0.865	0.040	2.092	0.025	2.223	0.024	2.300	0.026
C	2.353	0.018	1.287	0.017	2.342	0.021	2.176	0.021	2.320	0.023
D	2.052	0.033	0.998	0.026	2.070	0.032	2.153	0.033	2.080	0.036
E	2.304	0.018	1.247	0.019	2.278	0.023	2.164	0.021	2.182	0.022
F	1.910	0.030	0.587	0.040	1.958	0.028	2.086	0.026	2.172	0.031
G	1.996	0.014	0.941	0.022	2.004	0.015	2.015	0.017	2.034	0.017
H	1.914	0.035	0.878	0.027	2.046	0.034	2.055	0.030	1.937	0.030
I	2.349	0.046	1.237	0.046	2.345	0.045	2.448	0.048	2.526	0.048
J	2.330	0.017	1.280	0.019	2.291	0.023	2.152	0.025	2.259	0.026
K	2.035	0.033	0.990	0.047	2.045	0.036	2.065	0.034	2.286	0.040
L	2.298	0.019	1.041	0.028	2.184	0.031	2.305	0.022	2.344	0.031
M	2.569	0.026	1.227	0.029	2.408	0.036	2.545	0.026	2.620	0.030
N	2.727	0.026	1.512	0.021	2.558	0.034	2.753	0.030	2.757	0.034
O	2.139	0.026	0.893	0.032	2.062	0.030	2.197	0.027	2.227	0.027
P	2.527	0.022	1.562	0.023	2.506	0.024	2.301	0.030	2.448	0.027
Q	2.261	0.057	1.061	0.043	2.257	0.056	2.321	0.058	2.492	0.065
R	2.411	0.020	1.368	0.021	2.433	0.027	2.229	0.027	2.306	0.027
S	2.354	0.038	1.106	0.041	2.521	0.044	2.322	0.043	2.682	0.057
T	2.474	0.019	1.416	0.018	2.528	0.026	2.280	0.028	2.506	0.027
U	2.558	0.026	1.424	0.031	2.378	0.031	2.567	0.031	2.554	0.032

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Family practice

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.125	0.009	2.000	-	2.000	-	2.000	-
A	2.539	0.018	1.651	0.019	2.428	0.022	2.320	0.026	2.472	0.025
B	1.772	0.022	0.966	0.016	1.745	0.026	1.755	0.027	1.731	0.033
C	2.258	0.022	1.352	0.016	1.953	0.033	2.302	0.024	2.138	0.028
D	2.728	0.045	1.717	0.029	2.452	0.055	2.677	0.045	2.690	0.043
E	2.261	0.022	1.309	0.017	2.093	0.028	2.355	0.025	2.296	0.028
F	2.245	0.023	1.287	0.016	2.063	0.025	2.284	0.021	2.252	0.023
G	2.922	0.052	1.963	0.023	2.690	0.051	2.938	0.039	2.858	0.045
H	2.758	0.039	1.758	0.030	2.581	0.040	2.705	0.037	2.901	0.046
I	1.547	0.032	0.700	0.028	1.656	0.031	1.728	0.034	1.476	0.054
J	1.656	0.035	0.900	0.031	1.698	0.034	1.783	0.034	1.590	0.034
K	2.460	0.023	1.634	0.016	2.377	0.027	2.367	0.031	2.435	0.038
L	1.949	0.019	1.068	0.015	1.973	0.024	1.943	0.018	2.037	0.027
M	1.880	0.022	1.050	0.016	1.928	0.025	1.919	0.022	2.025	0.027
N	2.115	0.017	1.307	0.015	2.053	0.019	2.135	0.015	2.010	0.024
O	2.130	0.014	1.210	0.012	2.156	0.016	2.091	0.016	2.190	0.019
P	2.332	0.015	1.387	0.014	2.370	0.017	2.273	0.020	2.456	0.022
Q	2.268	0.015	1.337	0.015	2.296	0.017	2.232	0.020	2.360	0.020
R	2.070	0.024	1.218	0.022	2.010	0.025	2.037	0.020	1.958	0.024
S	2.361	0.019	1.488	0.019	2.341	0.019	2.254	0.021	2.314	0.023
T	2.599	0.019	1.754	0.019	2.540	0.019	2.458	0.025	2.603	0.027
U	2.479	0.018	1.578	0.017	2.465	0.022	2.273	0.027	2.381	0.025
V	2.563	0.020	1.668	0.018	2.507	0.023	2.391	0.023	2.545	0.025
W	2.064	0.018	1.228	0.014	2.047	0.018	2.057	0.018	1.975	0.021
X	2.053	0.029	0.963	0.022	2.166	0.030	1.898	0.037	2.340	0.034
Y	1.966	0.025	1.080	0.024	2.067	0.029	1.904	0.037	2.100	0.028

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): General surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.617	0.014	2.000	-	2.000	-	2.000	-
A	2.837	0.023	2.392	0.014	2.760	0.026	2.799	0.020	2.818	0.026
B	1.588	0.026	1.174	0.024	1.666	0.039	1.604	0.031	1.900	0.034
C	1.481	0.045	1.233	0.027	1.595	0.046	1.540	0.056	1.829	0.053
D	2.466	0.019	2.013	0.014	2.378	0.024	2.416	0.020	2.371	0.027
E	2.020	0.026	1.329	0.032	2.091	0.033	2.049	0.024	2.240	0.031
F	1.835	0.050	1.458	0.028	1.907	0.030	1.935	0.028	2.101	0.036
G	2.651	0.017	2.181	0.011	2.566	0.020	2.594	0.018	2.616	0.023
H	2.094	0.015	1.563	0.017	2.117	0.018	2.073	0.016	2.159	0.020
I	1.365	0.029	1.079	0.022	1.429	0.033	1.388	0.030	1.512	0.038
J	2.111	0.039	1.756	0.029	2.078	0.040	2.063	0.038	2.181	0.038
K	2.364	0.017	1.806	0.014	2.321	0.019	2.339	0.016	2.346	0.023
L	2.406	0.021	1.929	0.014	2.328	0.026	2.378	0.021	2.372	0.031
M	1.894	0.030	1.477	0.023	1.910	0.042	1.924	0.035	1.983	0.049
N	1.731	0.040	1.391	0.029	1.767	0.049	1.764	0.045	1.856	0.047
O	1.673	0.047	1.702	0.031	1.964	0.047	1.523	0.074	1.880	0.050
P	1.543	0.045	1.517	0.021	1.811	0.044	1.459	0.066	1.810	0.051
Q	1.150	0.041	1.111	0.020	1.389	0.051	1.108	0.055	1.358	0.055
R	1.225	0.044	1.208	0.018	1.451	0.054	1.181	0.055	1.442	0.058
S	1.491	0.041	1.415	0.017	1.831	0.048	1.458	0.056	1.959	0.045
T	1.610	0.040	1.567	0.019	1.863	0.040	1.482	0.058	1.915	0.047
U	1.129	0.044	1.043	0.019	1.389	0.048	1.118	0.056	1.426	0.059
V	2.026	0.048	1.771	0.026	2.232	0.044	1.859	0.066	2.364	0.041
W	1.778	0.044	1.630	0.017	2.061	0.043	1.698	0.056	2.150	0.043
X	1.762	0.037	1.501	0.030	1.924	0.044	1.863	0.040	2.116	0.050
Y	2.112	0.049	1.862	0.025	2.278	0.043	2.059	0.047	2.366	0.045

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Internal medicine

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.193	0.012	2.000	-	2.000	-	2.000	-
A	2.721	0.020	1.820	0.019	2.655	0.025	2.517	0.028	2.703	0.024
B	1.908	0.024	1.141	0.017	1.971	0.020	1.923	0.018	1.984	0.023
C	2.129	0.028	1.164	0.026	1.938	0.033	2.278	0.030	2.269	0.026
D	2.219	0.027	1.265	0.022	2.015	0.032	2.364	0.024	2.262	0.024
E	1.546	0.031	0.789	0.034	1.621	0.036	1.818	0.038	1.530	0.054
F	2.357	0.021	1.546	0.020	2.308	0.025	2.150	0.023	2.298	0.024
G	2.631	0.019	1.763	0.017	2.583	0.020	2.376	0.025	2.600	0.024
H	1.898	0.023	1.094	0.019	1.964	0.025	1.943	0.024	2.065	0.029
I	2.097	0.015	1.240	0.011	2.131	0.020	2.045	0.017	2.174	0.021
J	2.311	0.015	1.462	0.016	2.346	0.017	2.217	0.019	2.422	0.020
K	2.459	0.018	1.578	0.017	2.476	0.021	2.280	0.021	2.464	0.022
L	2.337	0.019	1.418	0.015	2.389	0.019	2.222	0.021	2.391	0.023
M	2.547	0.021	1.713	0.019	2.470	0.020	2.326	0.025	2.497	0.023
N	2.138	0.020	1.246	0.015	2.156	0.022	2.081	0.019	2.161	0.023
O	2.205	0.020	1.257	0.015	2.216	0.023	2.115	0.020	2.313	0.024
P	2.038	0.026	1.187	0.016	1.983	0.023	1.978	0.028	1.954	0.027
Q	2.430	0.020	1.576	0.018	2.402	0.021	2.286	0.021	2.417	0.021
R	2.522	0.020	1.685	0.014	2.519	0.020	2.331	0.021	2.527	0.021
S	2.193	0.022	1.413	0.021	2.189	0.022	2.113	0.019	2.172	0.023
T	2.215	0.027	1.530	0.016	2.061	0.026	2.085	0.025	2.021	0.027
U	1.813	0.029	0.884	0.032	1.915	0.031	1.944	0.035	1.986	0.032
V	1.809	0.027	0.899	0.021	2.037	0.031	1.677	0.060	2.191	0.031
W	2.180	0.028	1.102	0.022	2.320	0.026	1.838	0.070	2.454	0.023
X	2.016	0.028	1.157	0.020	2.073	0.027	1.762	0.064	2.119	0.033

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): obstetrics and gynecology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.111	0.021	2.000	-	2.000	-	2.000	-
A	2.044	0.038	1.434	0.016	2.156	0.038	1.795	0.043	1.889	0.038
B	1.576	0.037	1.003	0.020	1.693	0.040	1.494	0.038	1.678	0.041
C	2.065	0.038	1.537	0.017	2.113	0.038	1.829	0.039	2.080	0.045
D	1.860	0.040	1.225	0.016	1.969	0.044	1.751	0.042	2.044	0.043
E	2.362	0.038	1.993	0.052	2.266	0.037	2.134	0.047	2.354	0.042
F	2.556	0.035	2.268	0.051	2.495	0.035	2.267	0.050	2.604	0.037
G	2.507	0.038	2.124	0.045	2.527	0.038	2.263	0.045	2.613	0.044
H	2.639	0.038	2.354	0.048	2.578	0.038	2.368	0.048	2.663	0.044
I	2.483	0.022	1.725	0.017	2.355	0.026	2.455	0.023	2.395	0.031
J	2.698	0.025	1.953	0.015	2.580	0.029	2.650	0.029	2.628	0.031
K	1.777	0.034	1.259	0.013	1.818	0.033	1.723	0.034	1.770	0.030
L	2.011	0.037	1.360	0.014	2.134	0.034	1.940	0.042	2.196	0.034
M	2.377	0.029	1.603	0.026	2.279	0.033	2.334	0.036	2.408	0.039
N	2.074	0.031	1.439	0.015	2.228	0.034	2.193	0.031	2.185	0.037
O	2.346	0.026	1.484	0.020	2.295	0.029	2.365	0.029	2.436	0.034
P	1.692	0.033	1.205	0.014	1.752	0.033	1.640	0.035	1.723	0.034
Q	2.561	0.029	1.711	0.015	2.483	0.035	2.578	0.027	2.600	0.037
R	2.177	0.044	1.523	0.018	2.288	0.033	2.159	0.049	2.345	0.046
S	2.089	0.037	1.300	0.024	2.108	0.029	2.056	0.031	2.323	0.037
T	1.607	0.037	0.814	0.035	1.943	0.041	1.602	0.050	2.047	0.040
U	1.947	0.036	1.441	0.018	2.014	0.028	1.763	0.042	1.902	0.036
V	2.732	0.028	2.027	0.014	2.623	0.031	2.718	0.032	2.671	0.034
W	2.179	0.032	1.291	0.022	2.201	0.030	2.187	0.023	2.354	0.037
X	2.161	0.038	1.606	0.014	2.257	0.039	1.949	0.047	1.995	0.036
Y	2.265	0.042	1.526	0.020	2.327	0.034	2.287	0.035	2.336	0.042
Z	2.034	0.040	1.450	0.018	2.162	0.040	1.865	0.045	2.078	0.040

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Ophthalmology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.132	0.019	2.000	-	2.000	-	2.000	-
A	3.406	0.043	2.006	0.018	3.370	0.038	3.381	0.036	3.441	0.044
B	1.872	0.036	1.162	0.018	2.043	0.039	1.863	0.038	1.814	0.049
C	2.103	0.034	1.446	0.017	2.234	0.037	2.058	0.036	2.019	0.046
D	2.353	0.032	1.721	0.021	2.431	0.034	2.288	0.035	2.303	0.046
E	3.095	0.034	1.589	0.019	3.062	0.031	3.085	0.029	3.157	0.035
F	1.934	0.036	0.951	0.035	2.187	0.045	1.900	0.044	2.164	0.055
G	2.162	0.031	1.218	0.022	2.227	0.037	2.098	0.036	2.186	0.055
H	2.304	0.029	1.307	0.024	2.424	0.040	2.315	0.038	2.413	0.048
I	2.965	0.030	1.862	0.020	2.884	0.032	2.897	0.032	2.997	0.046
J	3.246	0.037	1.722	0.015	3.232	0.033	3.235	0.032	3.330	0.037
K	3.045	0.028	1.706	0.016	3.022	0.027	3.003	0.024	3.048	0.037
L	3.151	0.032	1.694	0.018	3.146	0.032	3.141	0.028	3.227	0.040
M	3.331	0.041	1.975	0.021	3.310	0.038	3.307	0.039	3.343	0.043
N	3.045	0.048	1.845	0.032	2.958	0.047	2.933	0.045	3.030	0.043
O	2.382	0.032	1.732	0.022	2.376	0.034	2.317	0.035	2.245	0.050
P	1.886	0.041	1.001	0.030	2.101	0.046	1.805	0.067	2.065	0.053
Q	2.323	0.030	1.521	0.034	2.413	0.034	2.255	0.041	2.412	0.041
R	2.054	0.040	1.115	0.036	2.098	0.050	2.067	0.045	2.015	0.062
S	1.812	0.035	1.077	0.024	1.993	0.045	1.857	0.045	1.945	0.050
T	3.028	0.066	1.490	0.032	2.982	0.052	2.995	0.062	3.165	0.057
U	2.820	0.036	1.671	0.024	2.779	0.036	2.793	0.036	2.825	0.036

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Oral and maxillofacial surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.398	0.015	2.000	-	2.000	-	2.000	-
A	3.345	0.035	2.404	0.013	3.245	0.047	3.237	0.044	3.328	0.042
B	1.469	0.026	1.216	0.018	1.663	0.036	1.369	0.044	1.545	0.053
C	2.508	0.021	1.619	0.015	2.309	0.033	2.429	0.027	2.463	0.035
D	2.584	0.021	1.693	0.015	2.359	0.032	2.477	0.028	2.520	0.031
E	2.146	0.026	1.465	0.018	2.278	0.027	2.201	0.026	2.480	0.045
F	2.018	0.035	1.122	0.028	2.183	0.036	2.078	0.032	2.369	0.049
G	2.377	0.026	1.501	0.020	2.285	0.031	2.215	0.032	2.364	0.039
H	1.760	0.026	1.000	0.032	1.805	0.032	1.792	0.028	1.868	0.039
I	3.120	0.033	2.143	0.013	3.061	0.040	3.042	0.041	3.115	0.039
J	1.910	0.023	1.213	0.021	1.961	0.035	1.936	0.033	2.004	0.039
K	2.176	0.035	1.636	0.018	2.365	0.041	2.094	0.043	2.219	0.050
L	1.753	0.030	1.267	0.019	1.938	0.041	1.730	0.037	2.065	0.047
M	2.217	0.031	1.644	0.019	2.325	0.033	2.225	0.031	2.521	0.045
N	2.162	0.035	1.186	0.028	2.311	0.034	2.221	0.032	2.508	0.046
O	2.571	0.031	1.703	0.019	2.467	0.036	2.477	0.036	2.525	0.041
P	2.719	0.028	1.809	0.014	2.504	0.034	2.585	0.033	2.522	0.037
Q	3.030	0.031	2.111	0.013	2.883	0.035	2.939	0.036	2.896	0.037
R	1.467	0.028	0.897	0.032	1.682	0.033	1.555	0.035	1.658	0.039
S	1.918	0.035	1.351	0.029	2.165	0.043	1.939	0.042	2.154	0.048
T	3.008	0.032	2.090	0.017	2.893	0.039	2.912	0.038	2.948	0.036
U	2.838	0.046	1.704	0.023	2.808	0.052	2.810	0.047	2.795	0.054
V	2.855	0.037	1.983	0.018	2.726	0.039	2.756	0.040	2.760	0.043
W	3.073	0.037	2.059	0.013	2.983	0.037	2.981	0.038	3.076	0.036

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Orthopedic surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.435	0.015	2.000	-	2.000	-	2.000	-
A	2.892	0.022	2.107	0.013	2.802	0.029	2.872	0.027	2.885	0.030
B	1.398	0.048	1.007	0.022	1.568	0.056	1.302	0.060	1.592	0.060
C	2.282	0.021	1.749	0.013	2.184	0.024	2.297	0.025	2.240	0.032
D	2.466	0.023	1.819	0.016	2.382	0.029	2.529	0.030	2.305	0.031
E	2.751	0.029	1.932	0.015	2.688	0.032	2.751	0.030	2.796	0.033
F	2.665	0.025	1.865	0.017	2.508	0.031	2.645	0.027	2.552	0.037
G	2.420	0.029	1.750	0.019	2.327	0.028	2.384	0.027	2.406	0.030
H	1.731	0.043	1.466	0.016	1.913	0.045	1.687	0.043	1.806	0.050
I	1.750	0.044	1.463	0.017	1.943	0.044	1.712	0.049	1.876	0.047
J	2.182	0.053	1.726	0.030	2.360	0.047	2.154	0.058	2.556	0.045
K	1.451	0.044	1.217	0.015	1.632	0.045	1.488	0.057	1.537	0.043
L	1.272	0.052	0.825	0.029	1.521	0.045	1.312	0.061	1.646	0.055
M	1.582	0.041	0.978	0.043	1.620	0.045	1.645	0.043	1.718	0.053
N	1.558	0.041	1.356	0.016	1.763	0.046	1.498	0.053	1.618	0.038
O	1.345	0.056	0.881	0.039	1.574	0.048	1.296	0.057	1.654	0.053
P	1.177	0.051	0.683	0.033	1.424	0.047	1.185	0.053	1.464	0.047
Q	1.204	0.051	0.707	0.033	1.443	0.048	1.218	0.053	1.480	0.050
R	1.377	0.036	1.059	0.023	1.455	0.038	1.495	0.035	1.579	0.042
S	1.919	0.045	1.517	0.037	2.022	0.042	1.943	0.045	2.119	0.046
T	2.877	0.032	2.191	0.013	2.832	0.034	2.866	0.036	2.898	0.037
U	1.253	0.049	0.733	0.031	1.480	0.046	1.254	0.054	1.541	0.049

NOTE: S.E. - Standard error of geometric mean.

Intra-service group ratings of the dimensions of work (logarithmic scale): Otolaryngology

Service	Work			Time			Mental effort			Technical skill and physical effort			Stress due to risk		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	S.E.
*	2.000	-	1.477	0.017	2.000	-	2.000	-	2.000	-	2.000	-	2.000	-	-
A	2.987	0.019	2.412	0.015	2.919	0.026	2.919	0.026	2.942	0.025	2.844	0.033	2.844	0.033	0.033
B	1.364	0.035	1.094	0.016	1.509	0.040	1.509	0.040	1.315	0.038	1.344	0.043	1.344	0.043	0.043
C	1.627	0.033	1.445	0.022	1.792	0.042	1.792	0.042	1.565	0.032	1.553	0.043	1.553	0.043	0.043
D	1.790	0.017	1.145	0.023	1.846	0.026	1.846	0.026	1.858	0.021	1.832	0.031	1.832	0.031	0.031
E	2.080	0.023	1.444	0.018	2.148	0.026	2.148	0.026	2.127	0.028	2.071	0.037	2.071	0.037	0.037
F	2.654	0.023	2.062	0.013	2.686	0.031	2.686	0.031	2.755	0.027	2.729	0.037	2.729	0.037	0.037
G	2.098	0.019	1.374	0.019	2.154	0.028	2.154	0.028	2.106	0.032	2.162	0.028	2.162	0.028	0.028
H	2.801	0.018	2.244	0.013	2.799	0.026	2.799	0.026	2.845	0.022	2.801	0.030	2.801	0.030	0.030
I	1.756	0.039	1.448	0.014	2.039	0.042	2.039	0.042	1.738	0.042	1.913	0.048	1.913	0.048	0.048
J	1.263	0.038	0.841	0.031	1.589	0.050	1.589	0.050	1.310	0.051	1.326	0.050	1.326	0.050	0.050
K	1.443	0.043	1.128	0.034	1.774	0.051	1.774	0.051	1.502	0.058	1.545	0.049	1.545	0.049	0.049
L	2.813	0.021	2.194	0.013	2.790	0.028	2.790	0.028	2.860	0.024	2.876	0.029	2.876	0.029	0.029
M	2.369	0.028	1.381	0.029	2.422	0.026	2.422	0.026	2.402	0.028	2.526	0.037	2.526	0.037	0.037
N	1.655	0.039	1.341	0.015	1.910	0.041	1.910	0.041	1.709	0.043	1.906	0.051	1.906	0.051	0.051
O	2.390	0.023	1.797	0.022	2.380	0.027	2.380	0.027	2.382	0.025	2.409	0.033	2.409	0.033	0.033
P	2.842	0.055	2.192	0.032	2.842	0.062	2.842	0.062	2.812	0.060	2.669	0.077	2.669	0.077	0.077
Q	3.064	0.035	2.503	0.025	3.030	0.034	3.030	0.034	3.043	0.032	2.954	0.053	2.954	0.053	0.053
R	1.962	0.021	1.396	0.023	1.999	0.025	1.999	0.025	2.016	0.021	2.042	0.036	2.042	0.036	0.036
S	1.742	0.045	1.504	0.019	2.104	0.053	2.104	0.053	1.786	0.051	1.872	0.061	1.872	0.061	0.061
T	2.317	0.017	1.687	0.018	2.266	0.021	2.266	0.021	2.295	0.018	2.243	0.024	2.243	0.024	0.024
U	1.577	0.030	1.065	0.026	1.655	0.036	1.655	0.036	1.739	0.037	1.693	0.044	1.693	0.044	0.044

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued
Intra-service group ratings of the dimensions of work (logarithmic scale): Pathology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	0.919	0.024	2.000	-	2.000	-	2.000	-
A	3.029	0.032	1.801	0.023	2.725	0.029	2.870	0.029	2.607	0.032
B	1.683	0.025	0.615	0.031	1.660	0.026	1.602	0.026	2.036	0.037
C	2.728	0.033	1.255	0.024	2.798	0.026	2.554	0.025	2.908	0.029
E	2.462	0.029	1.231	0.024	2.380	0.027	2.171	0.040	2.453	0.026
F	2.181	0.034	0.864	0.035	2.322	0.031	1.848	0.070	2.260	0.038
G	2.509	0.030	1.189	0.021	2.545	0.025	2.166	0.048	2.621	0.030
H	2.227	0.032	0.927	0.028	2.321	0.026	1.954	0.040	2.339	0.033
I	2.711	0.028	1.379	0.029	2.716	0.024	2.392	0.035	2.765	0.028
J	2.716	0.027	1.419	0.025	2.684	0.024	2.270	0.050	2.726	0.026
K	2.684	0.032	1.467	0.034	2.670	0.030	2.139	0.058	2.720	0.031
L	2.562	0.027	1.242	0.023	2.544	0.023	2.190	0.038	2.546	0.029
M	2.712	0.027	1.466	0.021	2.562	0.028	2.567	0.024	2.533	0.031
N	2.606	0.032	1.403	0.029	2.589	0.030	2.105	0.055	2.653	0.031
O	2.692	0.031	1.309	0.025	2.695	0.025	2.336	0.038	2.831	0.029
P	2.154	0.042	0.786	0.039	2.175	0.032	1.747	0.066	2.532	0.045
Q	2.447	0.027	1.094	0.023	2.450	0.022	2.141	0.030	2.547	0.024
R	2.157	0.029	0.951	0.026	2.116	0.027	2.037	0.037	2.114	0.030

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Pediatrics

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.035	0.016	2.000	-	2.000	-	2.000	-
A	2.759	0.030	1.534	0.037	2.738	0.035	2.732	0.029	2.899	0.038
B	1.743	0.020	0.848	0.021	1.827	0.023	1.738	0.029	1.742	0.023
C	2.227	0.018	1.238	0.014	2.183	0.020	2.134	0.021	2.044	0.025
D	2.271	0.018	1.270	0.015	2.226	0.021	2.198	0.023	2.047	0.025
E	2.371	0.020	1.379	0.015	2.265	0.024	2.223	0.024	2.094	0.027
F	2.429	0.021	1.437	0.015	2.344	0.024	2.283	0.027	2.150	0.027
G	2.635	0.022	1.665	0.022	2.542	0.021	2.509	0.027	2.588	0.025
H	2.495	0.020	1.465	0.015	2.481	0.019	2.409	0.022	2.519	0.022
I	2.380	0.021	1.291	0.017	2.409	0.022	2.317	0.025	2.496	0.023
J	2.032	0.034	0.868	0.026	2.200	0.029	1.951	0.036	2.346	0.027
K	2.501	0.029	0.678	0.056	2.406	0.035	2.581	0.026	2.656	0.031
L	2.588	0.022	1.534	0.020	2.543	0.024	2.431	0.025	2.543	0.026
M	2.101	0.029	0.816	0.042	2.123	0.030	2.244	0.029	2.267	0.030
N	2.428	0.026	1.150	0.032	2.337	0.030	2.501	0.023	2.470	0.028
O	2.471	0.020	1.477	0.017	2.481	0.022	2.251	0.032	2.327	0.027
P	2.328	0.021	1.305	0.017	2.125	0.028	2.348	0.026	2.265	0.025
Q	1.801	0.029	0.796	0.032	1.864	0.026	1.935	0.033	1.871	0.032
R	1.996	0.020	0.979	0.025	2.000	0.021	1.977	0.022	2.027	0.020
S	2.417	0.018	1.403	0.016	2.392	0.021	2.265	0.023	2.325	0.023
T	1.778	0.025	0.679	0.019	1.950	0.024	1.792	0.027	2.053	0.027
U	2.192	0.025	1.057	0.022	2.099	0.029	2.289	0.027	2.290	0.023

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Psychiatry

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.640	0.011	2.000	-	2.000	-	2.000	-
A	2.465	0.023	1.870	0.027	2.359	0.028	2.308	0.026	2.514	0.026
B	1.737	0.033	1.167	0.021	1.866	0.031	1.840	0.031	2.054	0.039
C	1.996	0.010	1.663	0.008	1.997	0.004	1.996	0.006	1.972	0.015
D	2.224	0.018	1.796	0.015	2.222	0.018	2.190	0.020	2.287	0.020
E	2.117	0.024	1.664	0.027	2.130	0.021	2.107	0.021	2.086	0.028
F	1.748	0.021	1.332	0.017	1.787	0.024	1.792	0.020	1.859	0.029
G	2.044	0.017	1.697	0.005	2.066	0.019	2.041	0.017	1.875	0.033
H	1.987	0.015	1.623	0.012	2.012	0.016	2.011	0.015	2.007	0.018
I	2.160	0.017	1.745	0.014	2.164	0.017	2.135	0.019	2.166	0.023
J	2.268	0.021	1.891	0.013	2.261	0.024	2.230	0.023	2.117	0.027
K	2.191	0.017	1.890	0.012	2.178	0.017	2.149	0.018	2.100	0.026
L	2.283	0.020	1.784	0.017	2.264	0.020	2.226	0.021	2.383	0.019
M	2.249	0.017	1.819	0.012	2.252	0.019	2.221	0.019	2.322	0.021
N	2.246	0.017	1.791	0.012	2.246	0.017	2.221	0.019	2.328	0.019
O	1.848	0.024	1.464	0.017	1.906	0.022	1.915	0.021	2.028	0.023
P	2.023	0.049	1.419	0.027	1.925	0.053	2.072	0.039	2.285	0.036
Q	2.565	0.021	2.162	0.025	2.462	0.023	2.416	0.026	2.471	0.023
R	2.170	0.022	1.808	0.015	2.180	0.022	2.146	0.020	1.987	0.034
S	2.146	0.017	1.699	0.011	2.169	0.017	2.144	0.017	2.219	0.018
T	2.281	0.020	1.822	0.016	2.286	0.020	2.236	0.018	2.308	0.024
U	2.085	0.017	1.698	0.005	2.105	0.020	2.116	0.019	1.978	0.022
V	2.439	0.023	2.061	0.024	2.367	0.024	2.336	0.025	2.370	0.024
W	2.239	0.019	1.803	0.018	2.204	0.021	2.198	0.020	2.237	0.022
X	2.119	0.029	1.724	0.030	2.120	0.022	2.084	0.027	2.064	0.029

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service ratings of the dimensions of work (logarithmic scale): Radiology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.234	0.020	2.000	-	2.000	-	2.000	-
A	2.893	0.020	1.966	0.017	2.774	0.028	2.837	0.028	2.965	0.032
B	1.485	0.020	0.528	0.026	1.757	0.027	1.072	0.058	1.846	0.035
C	1.614	0.022	0.728	0.026	1.715	0.025	1.131	0.061	1.683	0.028
D	2.184	0.013	1.374	0.019	2.128	0.014	2.133	0.014	2.189	0.019
E	2.229	0.021	1.372	0.023	2.238	0.019	2.266	0.023	2.110	0.024
F	2.256	0.026	1.185	0.024	2.315	0.023	1.759	0.076	2.245	0.027
G	2.294	0.024	1.354	0.023	2.290	0.024	2.281	0.025	2.408	0.031
H	2.545	0.024	1.670	0.017	2.435	0.032	2.526	0.030	2.604	0.035
I	1.385	0.025	0.491	0.028	1.483	0.027	1.055	0.057	1.606	0.033
J	1.928	0.029	0.910	0.029	2.073	0.026	1.451	0.071	2.256	0.034
K	2.428	0.032	1.543	0.043	2.395	0.037	1.913	0.108	2.335	0.035
L	1.634	0.021	0.706	0.029	1.726	0.023	1.192	0.061	1.748	0.027
M	2.062	0.018	1.354	0.025	2.001	0.016	1.866	0.026	2.264	0.028
N	2.257	0.023	1.442	0.018	2.064	0.025	2.165	0.024	2.314	0.027
O	1.603	0.022	0.672	0.029	1.681	0.024	1.158	0.061	1.667	0.031
P	1.711	0.055	0.800	0.054	1.642	0.059	1.388	0.083	1.578	0.060
Q	1.651	0.022	0.732	0.029	1.678	0.025	1.173	0.062	1.710	0.028
R	2.185	0.025	1.373	0.026	1.997	0.031	2.152	0.029	2.147	0.033
S	2.479	0.022	1.621	0.018	2.323	0.025	2.438	0.025	2.541	0.030
T	1.540	0.023	0.651	0.029	1.579	0.028	1.108	0.057	1.689	0.033

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Rheumatology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.240	0.011	2.000	-	2.000	-	2.000	-
A	2.748	0.022	1.841	0.012	2.747	0.024	2.384	0.028	2.756	0.027
B	1.646	0.029	0.716	0.028	1.951	0.032	1.807	0.039	1.839	0.038
C	2.540	0.020	1.735	0.010	2.521	0.023	2.302	0.024	2.440	0.026
D	2.652	0.020	1.774	0.012	2.632	0.023	2.390	0.026	2.612	0.024
E	2.002	0.028	1.089	0.023	1.942	0.035	2.226	0.031	2.217	0.033
F	1.950	0.030	1.163	0.026	1.972	0.036	2.144	0.036	1.926	0.038
G	1.923	0.031	0.978	0.023	1.913	0.034	2.190	0.030	2.215	0.032
H	2.502	0.020	1.703	0.011	2.461	0.025	2.267	0.024	2.379	0.028
I	2.183	0.019	1.293	0.013	2.251	0.021	2.121	0.019	2.420	0.020
J	2.325	0.019	1.439	0.013	2.346	0.021	2.169	0.019	2.368	0.023
K	2.726	0.023	1.846	0.011	2.718	0.024	2.408	0.027	2.742	0.027
L	1.798	0.047	0.933	0.046	1.939	0.049	1.943	0.050	1.894	0.051
M	2.209	0.019	1.345	0.014	2.217	0.019	2.124	0.021	2.214	0.021
N	2.019	0.021	1.236	0.013	2.051	0.018	2.027	0.018	2.045	0.024
O	2.514	0.018	1.733	0.009	2.463	0.023	2.310	0.023	2.456	0.025
P	1.390	0.033	0.461	0.035	1.625	0.036	1.365	0.059	1.583	0.040
Q	1.663	0.028	0.768	0.029	1.840	0.029	1.671	0.056	1.918	0.033
R	1.319	0.034	0.402	0.035	1.532	0.036	1.340	0.058	1.594	0.042

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Thoracic and cardiovascular surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.671	0.019	2.000	-	2.000	0.000	2.000	0.000
A	2.935	0.025	2.451	0.011	2.913	0.036	2.971	0.030	3.019	0.043
B	1.613	0.024	1.196	0.025	1.640	0.034	1.651	0.030	1.741	0.036
C	1.099	0.047	0.953	0.022	1.247	0.051	0.970	0.058	1.082	0.060
D	2.781	0.025	2.300	0.012	2.730	0.034	2.818	0.033	2.795	0.034
E	1.436	0.055	1.107	0.023	1.505	0.054	1.257	0.073	1.392	0.069
F	1.632	0.045	1.567	0.020	1.790	0.045	1.354	0.070	1.645	0.070
G	1.844	0.033	1.471	0.022	1.874	0.033	1.866	0.030	1.897	0.047
H	2.598	0.024	2.116	0.014	2.546	0.031	2.622	0.028	2.567	0.032
I	2.709	0.029	2.222	0.014	2.660	0.032	2.739	0.032	2.723	0.034
J	2.083	0.028	1.660	0.018	2.101	0.033	2.134	0.031	2.221	0.037
K	1.666	0.045	1.585	0.018	1.811	0.047	1.362	0.074	1.642	0.064
L	1.572	0.036	1.411	0.019	1.595	0.036	1.558	0.036	1.661	0.047
M	1.774	0.042	1.386	0.027	1.903	0.045	1.845	0.039	2.162	0.052
N	1.602	0.047	1.542	0.018	1.722	0.046	1.326	0.071	1.633	0.061
O	2.504	0.026	1.990	0.024	2.485	0.038	2.604	0.037	2.599	0.036
P	2.742	0.034	2.211	0.018	2.669	0.035	2.752	0.035	2.750	0.034
Q	2.288	0.037	1.947	0.039	2.202	0.044	2.267	0.039	2.354	0.044
R	2.067	0.032	1.373	0.028	2.077	0.037	2.089	0.029	2.182	0.039
S	2.788	0.030	2.398	0.014	2.669	0.031	2.799	0.030	2.773	0.036
T	2.780	0.027	2.270	0.013	2.725	0.040	2.814	0.030	2.855	0.042
U	1.650	0.045	1.552	0.019	1.814	0.049	1.387	0.078	1.650	0.070

NOTE: S.E. - Standard error of geometric mean.

Table 30 continued

Intra-service group ratings of the dimensions of work (logarithmic scale): Urology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	2.000	-	1.123	0.026	2.000	-	2.000	-	2.000	-
A	3.419	0.033	2.516	0.010	3.344	0.036	3.435	0.033	3.448	0.037
B	1.577	0.036	0.985	0.024	1.746	0.040	1.524	0.057	1.635	0.062
C	2.750	0.027	1.571	0.017	2.648	0.030	2.779	0.029	2.791	0.033
D	1.937	0.032	1.375	0.015	2.126	0.038	1.881	0.041	2.204	0.038
E	2.874	0.032	1.820	0.015	2.729	0.033	2.826	0.026	2.917	0.039
F	2.058	0.034	1.500	0.014	2.195	0.037	1.922	0.042	2.074	0.047
G	1.984	0.034	1.432	0.016	2.127	0.037	1.884	0.040	2.211	0.042
H	2.998	0.027	1.794	0.012	2.889	0.034	3.012	0.027	2.993	0.035
I	2.014	0.012	1.159	0.025	2.020	0.008	2.015	0.009	2.043	0.015
J	2.083	0.033	1.472	0.017	2.223	0.037	1.956	0.045	2.117	0.040
K	2.673	0.039	1.538	0.024	2.597	0.045	2.724	0.041	2.693	0.045
L	3.102	0.034	2.066	0.018	2.992	0.039	3.119	0.033	3.141	0.042
M	2.994	0.040	1.822	0.019	2.850	0.047	2.903	0.044	2.888	0.048
N	2.956	0.031	1.877	0.018	2.882	0.037	2.984	0.031	3.055	0.034
O	2.001	0.032	1.418	0.016	2.075	0.036	1.894	0.041	2.016	0.034
P	2.096	0.031	1.463	0.023	2.121	0.036	1.995	0.040	1.958	0.039
Q	2.388	0.019	1.498	0.017	2.346	0.026	2.424	0.021	2.390	0.024
R	1.674	0.046	1.195	0.032	1.852	0.057	1.684	0.049	1.731	0.055
S	2.184	0.034	1.578	0.017	2.336	0.038	2.050	0.044	2.311	0.040
T	2.706	0.034	1.726	0.015	2.463	0.053	2.639	0.043	2.546	0.046
U	2.437	0.026	1.616	0.023	2.285	0.030	2.404	0.028	2.547	0.035

NOTE: S.E. - Standard error of geometric mean.

Table 31

Intra-service group ratings of the dimensions of work (untransformed scale): Allergy and immunology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	15.2	3.6	100	-	100	-	100	-
A	375	6.3	49.9	9.7	223	8.8	244	7.9	441	6.9
B	116	5.9	15.5	3.9	131	5.1	112	4.5	144	6.2
C	191	6.2	22.2	7.4	147	8.0	195	5.8	194	7.0
D	189	6.6	20.8	7.2	167	8.1	208	5.9	254	7.3
E	494	5.0	71.4	4.6	464	5.7	337	6.7	469	6.8
F	376	5.0	56.9	3.6	400	5.4	280	6.0	302	5.5
G	46	9.4	7.8	10.8	59	10.2	60	8.9	194	8.9
H	92	6.9	8.8	6.8	155	7.2	105	8.6	106	8.0
I	247	12.9	20.1	7.4	228	12.9	311	12.4	252	13.2
J	387	10.8	49.7	11.5	300	10.1	320	10.4	437	9.7
K	180	8.1	18.5	7.4	217	7.5	189	8.6	287	6.8
L	402	5.0	60.2	3.7	426	5.1	267	6.8	313	6.8
M	158	7.0	23.1	8.1	159	8.0	179	6.9	156	7.8
N	393	5.3	57.0	3.7	409	5.8	255	6.9	254	5.8
O	213	4.8	24.6	3.6	256	5.7	197	4.8	269	5.6
P	259	5.5	36.8	3.7	283	6.3	184	7.2	183	6.3
Q	65	9.5	7.2	8.6	116	10.0	81	10.3	110	10.3
R	510	5.6	77.6	4.7	476	6.4	355	6.0	497	7.9

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Anesthesiology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	64.8	2.4	100	-	100	-	100	-
A	644	4.9	260.6	3.0	555	5.3	485	5.0	569	5.8
B	76	5.0	29.3	3.8	91	3.5	89	3.6	92	4.3
C	268	3.7	146.4	3.1	209	3.8	201	3.7	211	4.0
D	313	3.9	192.6	3.2	254	4.0	239	4.1	262	4.1
E	133	4.1	45.6	3.9	135	3.7	134	3.4	145	4.0
F	211	3.3	99.1	2.9	175	3.3	170	3.2	175	3.5
G	306	3.9	181.6	2.2	258	3.9	243	3.6	260	4.0
H	143	6.5	30.2	4.6	197	5.5	193	5.3	236	5.6
I	110	2.8	78.0	3.3	104	2.6	107	2.6	104	2.9
J	243	3.5	116.3	3.0	211	3.7	206	3.1	220	3.5
K	533	4.3	241.1	2.7	470	4.1	434	4.2	497	4.0
L	68	4.1	25.6	3.8	83	3.2	80	3.1	90	3.3
M	154	5.5	74.6	3.2	154	5.1	123	5.7	163	5.7
N	175	6.1	52.9	4.2	232	6.0	121	8.1	194	7.2
O	181	3.5	82.2	2.7	176	3.1	153	3.3	191	3.9
P	356	3.9	132.1	2.6	348	4.1	294	3.8	382	4.2
Q	106	3.4	61.2	4.8	107	3.5	113	4.1	126	4.7
R	132	4.9	35.3	4.6	146	4.5	159	4.4	195	5.0
S	185	3.4	121.7	2.4	144	3.5	141	3.4	147	3.3
T	455	4.6	237.1	4.0	411	4.5	375	4.3	433	5.0
U	242	3.9	81.0	2.6	248	4.0	217	4.1	312	4.8
V	117	5.8	36.8	4.7	162	5.8	95	6.2	154	7.2

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Dermatology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	10.4	5.1	100	-	100	-	100	-
A	348	5.6	21.4	5.7	246	7.7	376	6.7	404	7.1
B	142	6.6	7.3	9.5	124	5.9	167	5.7	200	6.2
C	225	4.2	19.4	4.0	220	5.0	150	4.9	209	5.5
D	113	7.8	10.0	6.2	117	7.6	142	8.0	120	8.5
E	201	4.3	17.7	4.4	190	5.4	146	4.9	152	5.1
F	81	7.1	3.9	9.7	91	6.6	122	6.1	149	7.3
G	99	3.2	8.7	5.1	101	3.6	103	4.0	108	4.1
H	82	8.4	7.6	6.4	111	8.1	113	7.1	87	7.2
I	224	11.1	17.3	11.3	221	10.8	281	11.8	336	11.8
J	214	4.1	19.0	4.4	195	5.5	142	6.0	182	6.3
K	108	7.9	9.8	11.4	111	8.7	116	8.1	193	9.8
L	199	4.5	11.0	6.7	153	7.3	202	5.2	221	7.3
M	371	6.1	16.9	6.9	256	8.6	351	6.1	417	7.1
N	534	6.2	32.5	4.9	362	8.2	567	7.1	572	8.1
O	138	6.1	7.8	7.6	115	7.1	157	6.3	169	6.4
P	337	5.1	36.5	5.3	320	5.6	200	7.1	281	6.4
Q	182	13.9	11.5	10.4	181	13.9	209	14.3	310	16.2
R	258	4.8	23.3	4.9	271	6.3	169	6.4	202	6.4
S	226	9.0	12.8	9.9	332	10.7	210	10.5	481	14.0
T	298	4.4	26.1	4.2	337	6.1	190	6.7	321	6.4
U	361	6.3	26.5	7.3	239	7.4	369	7.4	358	7.6

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Family practice

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	13.3	2.1	100	-	100	-	100	-
A	346	4.2	44.8	4.5	268	5.3	209	6.1	296	5.9
B	59	5.3	9.2	3.8	56	6.3	57	6.5	54	7.9
C	181	5.2	22.5	3.9	90	7.8	200	5.7	138	6.7
D	535	10.9	52.1	6.8	283	13.6	475	10.9	490	10.3
E	182	5.3	20.4	4.0	124	6.8	226	6.0	198	6.6
F	176	5.3	19.4	3.8	116	6.0	192	5.0	179	5.6
G	836	12.6	91.9	5.5	489	12.5	866	9.3	720	11.0
H	573	9.3	57.3	7.2	381	9.6	507	8.9	795	11.3
I	35	7.7	5.0	6.7	45	7.5	53	8.0	30	13.1
J	45	8.5	7.9	7.4	50	8.1	61	8.1	39	8.2
K	289	5.4	43.1	3.8	238	6.5	233	7.3	272	9.2
L	89	4.5	11.7	3.6	94	5.6	88	4.2	109	6.3
M	76	5.3	11.2	3.7	85	6.0	83	5.3	106	6.5
N	130	4.1	20.3	3.4	113	4.4	136	3.6	102	5.8
O	135	3.3	16.2	2.8	143	3.6	123	3.8	155	4.5
P	215	3.5	24.4	3.3	234	3.9	188	4.7	286	5.2
Q	185	3.5	21.7	3.4	198	4.1	171	4.6	229	4.8
R	118	5.7	16.5	5.2	102	5.8	109	4.7	91	5.6
S	230	4.5	30.8	4.4	219	4.4	179	5.0	206	5.5
T	397	4.6	56.7	4.5	347	4.5	287	6.0	401	6.4
U	301	4.3	37.8	4.0	292	5.3	188	6.5	241	5.8
V	366	4.8	46.6	4.3	321	5.6	246	5.5	351	5.8
W	116	4.2	16.9	3.2	111	4.2	114	4.2	94	5.0
X	113	6.8	9.2	5.2	147	7.1	79	8.8	219	8.2
Y	93	5.9	12.0	5.7	117	6.9	80	8.9	126	6.7

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): General surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
* A	100	-	41.4	3.2	100	-	100	-	100	-
B	687	5.5	246.7	3.3	575	6.1	630	4.8	658	6.2
C	39	6.2	14.9	5.6	46	9.3	40	7.5	79	8.1
D	30	11.0	17.1	6.3	39	11.3	35	13.6	67	12.9
E	293	4.4	102.9	3.3	239	5.7	261	4.8	235	6.3
F	105	6.3	21.3	7.6	123	8.0	112	5.7	174	7.5
G	68	12.2	28.7	6.5	81	7.2	86	6.7	126	8.7
H	447	4.1	151.9	2.5	369	4.7	393	4.2	413	5.4
I	124	3.5	36.6	4.0	131	4.3	118	3.8	144	4.8
J	23	6.8	12.0	5.3	27	7.8	24	7.2	33	9.0
K	129	9.3	57.0	7.0	120	9.6	116	9.1	152	9.0
L	231	4.0	64.0	3.3	210	4.4	218	3.8	222	5.4
M	255	4.9	84.9	3.4	213	6.1	239	5.0	235	7.3
N	78	7.0	30.0	5.6	81	10.2	84	8.3	96	11.9
O	54	9.7	24.6	6.9	58	11.9	58	11.0	72	11.5
P	47	11.4	50.4	7.4	92	11.4	33	18.6	76	12.2
Q	35	10.8	32.9	5.1	65	10.8	29	16.4	65	12.5
R	14	9.9	12.9	4.6	24	12.5	13	13.5	23	13.6
S	17	10.7	16.1	4.2	28	13.2	15	13.5	28	14.3
T	31	9.9	26.0	3.9	68	11.7	29	13.9	91	11.0
U	41	9.6	36.9	4.6	73	9.7	30	14.3	82	11.4
V	13	10.7	11.0	4.5	24	11.7	13	13.8	27	14.4
W	106	11.7	59.1	6.2	171	10.8	72	16.3	231	9.8
X	60	10.5	42.6	3.9	115	10.4	50	13.7	141	10.3
Y	58	9.0	31.7	7.1	84	10.5	73	9.6	130	12.3
	129	12.0	72.7	5.9	190	10.3	115	11.5	232	10.8

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Internal medicine

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	15.6	2.7	100	-	100	-	100	-
A	526	4.6	66.1	4.5	451	5.9	329	6.6	504	5.8
B	81	5.7	13.8	4.1	93	4.7	84	4.2	96	5.5
C	135	6.6	14.6	6.1	87	7.9	190	7.2	186	6.2
D	165	6.4	18.4	5.1	104	7.7	231	5.6	183	5.7
E	35	7.5	6.2	8.1	42	8.6	66	9.0	34	13.3
F	227	4.9	35.2	4.7	203	6.0	141	5.4	199	5.8
G	427	4.6	57.9	4.0	383	4.8	237	6.0	398	5.7
H	79	5.5	12.4	4.5	92	6.0	88	5.7	116	7.0
I	125	3.5	17.4	2.6	135	4.7	111	4.0	149	5.0
J	205	3.6	29.0	3.8	222	4.0	165	4.4	264	4.6
K	288	4.2	37.8	4.0	299	5.0	190	5.0	291	5.2
L	217	4.4	26.2	3.6	245	4.6	167	5.0	246	5.3
M	352	4.9	51.7	4.4	295	4.8	212	5.9	314	5.5
N	137	4.8	17.6	3.6	143	5.1	121	4.6	145	5.4
O	160	4.8	18.1	3.5	164	5.4	130	4.8	206	5.7
P	109	6.2	15.4	3.8	96	5.5	95	6.6	90	6.4
Q	269	4.7	37.6	4.3	252	4.9	193	5.0	261	5.0
R	333	4.6	48.4	3.2	330	4.8	214	4.9	337	5.1
S	156	5.3	25.9	4.8	154	5.1	130	4.4	149	5.5
T	164	6.3	33.9	3.7	115	6.3	122	5.9	105	6.5
U	65	6.9	7.6	7.7	82	7.3	88	8.5	97	7.7
V	64	6.3	7.9	4.9	109	7.4	48	14.9	155	7.4
W	151	6.7	12.7	5.1	209	6.2	69	17.5	285	5.4
X	104	6.8	14.4	4.8	118	6.4	58	16.0	132	7.8

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service ratings of the dimensions of work (untransformed scale): Obstetrics and

gynecology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	12.9	5.0	100	-	100	-	100	-
A	111	9.1	27.2	3.9	143	9.0	62	10.3	77	9.1
B	38	8.9	10.1	4.7	49	9.5	31	9.0	48	10.0
C	116	9.1	34.5	4.1	130	9.1	67	9.4	120	10.8
D	72	9.7	16.8	3.7	93	10.6	56	10.2	111	10.4
E	230	9.1	98.5	12.6	185	8.9	136	11.4	226	10.2
F	360	8.3	185.3	12.4	312	8.4	185	12.2	402	9.0
G	321	9.1	133.1	10.8	336	9.2	183	10.8	410	10.6
H	435	9.1	226.0	11.7	378	9.2	233	11.7	460	10.7
I	304	5.2	53.1	4.0	227	6.1	285	5.4	248	7.3
J	499	6.0	89.7	3.5	380	6.8	447	6.9	424	7.3
K	60	8.0	18.2	3.1	66	7.8	53	8.3	59	7.2
L	103	8.9	22.9	3.3	136	8.2	87	10.2	157	8.2
M	238	6.9	40.0	6.2	190	7.9	216	8.6	256	9.5
N	118	7.4	27.5	3.5	169	8.1	156	7.5	153	9.0
O	222	6.1	30.5	4.6	197	7.0	231	6.8	273	8.2
P	49	7.9	16.0	3.2	56	8.0	44	8.5	53	8.1
Q	364	6.9	51.5	3.6	304	8.4	378	6.4	398	8.9
R	150	10.6	33.4	4.2	194	7.9	144	12.1	221	11.3
S	123	9.0	20.0	5.7	128	7.0	114	7.3	210	9.0
T	40	8.8	6.5	8.5	88	10.0	40	12.1	111	9.6
U	88	8.6	27.6	4.2	103	6.7	58	10.2	80	8.5
V	540	6.6	106.4	3.3	419	7.4	522	7.6	468	8.0
W	151	7.6	19.5	5.1	159	7.2	154	5.3	226	9.0
X	145	9.0	40.4	3.2	181	9.4	89	11.5	99	8.5
Y	184	10.2	33.5	4.8	212	8.2	194	8.4	217	10.2
Z	108	9.6	28.2	4.1	145	9.7	73	10.9	120	9.7

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service ratings of the dimensions of work (untransformed scale): Ophthalmology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	13.6	4.5	100	-	100	-	100	-
A	2544	10.3	101.5	4.2	2343	9.3	2406	8.7	2760	10.6
B	74	8.6	14.5	4.3	110	9.4	73	9.1	65	11.9
C	127	8.0	27.9	3.9	171	8.9	114	8.6	104	11.3
D	226	7.6	52.6	5.0	270	8.2	194	8.3	201	11.2
E	1246	8.0	38.8	4.5	1154	7.4	1216	7.0	1436	8.3
F	86	8.7	8.9	8.5	154	10.9	79	10.6	146	13.6
G	145	7.3	16.5	5.1	169	8.8	125	8.7	153	13.5
H	201	6.8	20.3	5.8	265	9.7	207	9.1	259	11.6
I	923	7.2	72.8	4.7	766	7.7	789	7.6	993	11.2
J	1764	8.9	52.7	3.6	1705	8.0	1718	7.6	2137	8.8
K	1109	6.8	50.8	3.7	1052	6.5	1007	5.8	1117	8.9
L	1417	7.7	49.5	4.2	1400	7.7	1384	6.7	1687	9.7
M	2143	10.0	94.3	5.1	2044	9.2	2027	9.3	2201	10.4
N	1109	11.7	70.0	7.6	907	11.3	857	10.9	1071	10.5
O	241	7.6	54.0	5.3	237	8.1	207	8.4	176	12.2
P	77	9.8	10.0	7.1	126	11.2	64	16.7	116	12.9
Q	210	7.0	33.2	8.1	259	8.3	180	9.8	258	9.9
R	113	9.8	13.0	8.6	125	12.2	117	11.0	103	15.4
S	65	8.4	11.9	5.7	98	10.9	72	11.0	88	12.3
T	1067	16.5	30.9	7.6	959	12.7	989	15.3	1463	14.1
U	660	8.5	46.8	5.6	601	8.7	620	8.7	668	8.6

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Oral and maxillofacial surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	25.0	3.5	100	-	100	-	100	-
A	2213	8.3	253.3	3.1	1757	11.5	1726	10.8	2127	10.1
B	29	6.2	16.4	4.2	46	8.7	23	10.8	35	13.0
C	322	4.9	41.6	3.4	204	7.9	268	6.5	290	8.3
D	383	5.0	49.3	3.5	229	7.7	300	6.7	331	7.4
E	140	6.1	29.2	4.2	190	6.4	159	6.2	302	10.8
F	104	8.3	13.2	6.6	152	8.7	120	7.6	234	12.0
G	238	6.3	31.7	4.7	193	7.3	164	7.7	231	9.4
H	58	6.2	10.0	7.6	64	7.7	62	6.7	74	9.5
I	1318	7.9	139.0	3.0	1150	9.6	1101	9.8	1303	9.4
J	81	5.5	16.3	5.0	91	8.5	86	7.8	101	9.3
K	150	8.3	43.3	4.3	232	9.8	124	10.3	165	12.3
L	57	7.1	18.5	4.5	87	9.9	54	9.0	116	11.6
M	165	7.4	44.0	4.4	211	7.9	168	7.3	332	10.8
N	145	8.3	15.3	6.6	205	8.2	166	7.6	322	11.2
O	372	7.3	50.5	4.6	293	8.7	300	8.5	335	9.8
P	523	6.7	64.4	3.2	319	8.1	385	7.9	332	8.9
Q	1071	7.3	129.0	2.9	763	8.3	869	8.7	788	8.8
R	29	6.6	7.9	7.7	48	7.8	36	8.5	45	9.3
S	83	8.5	22.4	7.0	146	10.4	87	10.1	142	11.8
T	1018	7.8	123.1	4.1	781	9.3	817	9.1	887	8.6
U	689	11.1	50.6	5.3	642	12.8	646	11.5	623	13.2
V	717	8.9	96.2	4.2	532	9.3	570	9.6	575	10.3
W	1183	8.8	114.5	3.0	961	8.9	958	9.1	1193	8.8

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service ratings of the dimensions of work (untransformed scale): Orthopedic surgery

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	27.2	3.6	100	-	100	-	100	-
A	780	5.1	127.9	3.0	633	6.9	744	6.3	767	7.1
B	25	11.6	10.2	5.2	37	13.7	20	14.9	39	14.8
C	191	5.0	56.1	3.0	153	5.6	198	5.9	174	7.6
D	292	5.5	65.9	3.8	241	6.9	338	7.1	202	7.4
E	564	7.0	85.6	3.6	487	7.6	564	7.2	625	8.0
F	462	5.9	73.2	4.0	322	7.4	442	6.4	356	8.8
G	263	6.9	56.2	4.5	212	6.7	242	6.5	255	7.1
H	54	10.5	29.3	3.7	82	10.9	49	10.4	64	12.3
I	56	10.6	29.0	3.9	88	10.7	52	11.9	75	11.5
J	152	13.1	53.2	7.1	229	11.3	142	14.3	360	10.9
K	28	10.7	16.5	3.5	43	10.8	31	14.1	34	10.4
L	19	12.8	6.7	6.9	33	10.8	20	15.1	44	13.4
M	38	10.0	9.5	10.3	42	10.9	44	10.5	52	12.9
N	36	9.9	22.7	3.9	58	11.1	31	13.1	41	9.2
O	22	13.8	7.6	9.4	37	11.7	20	14.0	45	12.9
P	15	12.5	4.8	7.9	27	11.3	15	12.9	29	11.4
Q	16	12.5	5.1	7.9	28	11.7	17	13.1	30	12.2
R	24	8.8	11.5	5.4	29	9.1	31	8.4	38	10.2
S	83	10.9	32.9	9.0	105	10.2	88	10.9	131	11.2
T	753	7.6	155.1	2.9	679	8.0	734	8.6	791	8.8
U	18	12.0	5.4	7.4	30	11.2	18	13.3	35	11.9

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Otolaryngology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	30.0	4.0	100	-	100	-	100	-
A	970	4.5	258.3	3.4	829	6.1	874	6.0	698	8.0
B	23	8.3	12.4	3.6	32	9.6	21	9.0	22	10.4
C	42	7.8	27.9	5.3	62	10.1	37	7.8	36	10.5
D	62	4.0	13.9	5.4	70	6.1	72	4.9	68	7.4
E	120	5.4	27.8	4.2	141	6.2	134	6.6	118	8.8
F	451	5.4	115.4	3.0	485	7.4	569	6.5	536	8.8
G	125	4.5	23.7	4.4	143	6.8	128	7.6	145	6.7
H	632	4.3	175.2	3.0	630	6.2	700	5.2	632	7.0
I	57	9.4	28.0	3.4	109	10.3	55	10.1	82	11.8
J	18	9.1	6.9	7.5	39	12.1	20	12.4	21	12.1
K	28	10.4	13.4	8.2	59	12.5	32	14.3	35	11.8
L	651	4.9	156.3	3.1	616	6.6	724	5.7	751	7.0
M	234	6.7	24.1	6.9	264	6.3	253	6.6	335	8.8
N	45	9.4	21.9	3.6	81	10.0	51	10.3	81	12.5
O	245	5.3	62.7	5.2	240	6.5	241	6.0	257	8.0
P	694	13.5	155.7	7.6	695	15.3	649	14.8	467	19.5
Q	1160	8.5	318.8	5.9	1072	8.2	1105	7.6	899	13.0
R	92	5.0	24.9	5.4	100	6.0	104	5.0	110	8.5
S	55	10.8	31.9	4.4	127	13.1	61	12.4	74	15.1
T	207	4.1	48.6	4.2	184	5.0	197	4.3	175	5.7
U	38	7.1	11.6	6.2	45	8.6	55	8.8	49	10.7

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Pathology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	8.3	5.6	100	-	100	-	100	0.0
A	1070	7.6	63.2	5.4	531	7.0	404	7.6	741	6.9
B	48	6.0	4.1	7.3	46	6.3	109	8.9	40	6.2
C	534	7.8	18.0	5.7	628	6.1	810	6.9	358	5.8
E	290	6.8	17.0	5.8	240	6.5	284	6.3	148	9.7
F	152	8.0	7.3	8.5	210	7.3	182	9.1	71	17.5
G	323	7.1	15.5	4.9	351	5.9	418	7.0	146	11.6
H	169	7.5	8.5	6.7	210	6.2	218	7.9	90	9.7
I	514	6.5	23.9	7.0	520	5.7	582	6.7	247	8.3
J	521	6.3	26.2	5.8	483	5.6	532	6.2	186	12.2
K	483	7.7	29.3	8.0	467	7.2	525	7.5	138	14.3
L	365	6.5	17.5	5.3	350	5.5	351	6.8	155	9.2
M	515	6.4	29.3	5.0	365	6.8	342	7.4	369	5.7
N	404	7.7	25.3	6.9	388	7.2	449	7.4	127	13.4
O	492	7.4	20.4	5.9	495	6.0	677	6.8	217	9.2
P	143	10.2	6.1	9.5	150	7.8	340	10.9	56	16.5
Q	280	6.4	12.4	5.5	282	5.2	352	5.8	138	7.2
R	143	7.0	8.9	6.1	131	6.5	130	7.1	109	8.9

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Pediatrics

Service	Work			Time			Mental effort			Technical skill and physical effort			Stress due to to risk		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	S.E.
*	100	-	10.8	3.7	100	-	100	-	100	-	100	-	100	-	-
A	574	7.1	34.2	8.9	547	8.3	540	8.3	540	7.0	793	7.0	793	9.1	9.1
B	55	4.6	7.1	5.0	67	5.6	55	5.6	55	7.0	55	7.0	55	5.4	5.4
C	169	4.1	17.3	3.3	152	4.8	136	4.8	136	4.9	111	4.9	111	6.0	6.0
D	187	4.3	18.6	3.4	168	5.0	158	5.0	158	5.5	111	5.5	111	5.8	5.8
E	235	4.7	24.0	3.5	184	5.6	167	5.6	167	5.7	124	5.7	124	6.4	6.4
F	268	5.1	27.4	3.6	221	5.6	192	5.6	192	6.3	141	6.3	141	6.4	6.4
G	432	5.1	46.2	5.2	348	5.0	323	5.0	323	6.5	387	6.5	387	6.0	6.0
H	313	4.7	29.2	3.6	302	4.5	256	4.5	256	5.3	330	5.3	330	5.2	5.2
I	240	4.9	19.5	3.9	256	5.2	207	5.2	207	5.8	313	5.8	313	5.3	5.3
J	108	8.3	7.4	6.2	159	7.0	89	7.0	89	8.7	222	8.7	222	6.5	6.5
K	317	7.0	4.8	13.8	255	8.3	381	8.3	381	6.3	453	6.3	453	7.4	7.4
L	387	5.3	34.2	4.7	349	5.8	270	5.8	270	6.0	349	6.0	349	6.2	6.2
M	126	6.8	6.6	10.2	133	7.2	175	7.2	175	6.8	185	6.8	185	7.1	7.1
N	268	6.2	14.1	7.5	217	7.2	317	7.2	317	5.4	295	5.4	295	6.7	6.7
O	296	4.8	30.0	4.0	303	5.2	178	5.2	178	7.6	213	7.6	213	6.5	6.5
P	213	4.9	20.2	3.9	133	6.7	223	6.7	223	6.1	184	6.1	184	6.0	6.0
Q	63	6.9	6.2	7.5	73	6.2	86	6.2	86	8.0	74	8.0	74	7.7	7.7
R	99	4.8	9.5	5.8	100	4.9	95	4.9	95	5.1	106	5.1	106	4.8	4.8
S	261	4.3	25.3	3.7	246	5.0	184	5.0	184	5.3	211	5.3	211	5.5	5.5
T	60	5.9	4.8	4.4	89	5.7	62	5.7	62	6.3	113	6.3	113	6.4	6.4
U	156	5.9	11.4	5.1	126	6.8	194	6.8	194	6.4	195	6.4	195	5.6	5.6

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Psychiatry

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	43.7	2.5	100	-	100	-	100	-
A	292	5.5	74.2	6.5	229	6.6	203	6.2	326	6.2
B	55	8.0	14.7	4.8	73	7.3	69	7.4	113	9.4
C	99	2.4	46.0	1.9	99	0.8	99	1.3	94	3.5
D	168	4.2	62.5	3.5	167	4.1	155	4.7	194	4.7
E	131	5.8	46.2	6.3	135	5.1	128	4.9	122	6.6
F	56	5.0	21.5	4.0	61	5.7	62	4.7	72	6.9
G	111	4.1	49.8	1.2	116	4.5	110	4.0	75	7.8
H	97	3.6	41.9	2.9	103	3.8	103	3.6	102	4.3
I	145	4.0	55.5	3.3	146	4.1	136	4.4	147	5.4
J	186	5.0	77.9	3.2	182	5.6	170	5.5	131	6.5
K	155	4.0	77.6	2.8	151	4.0	141	4.2	126	6.2
L	192	4.7	60.8	4.0	183	4.7	168	5.0	241	4.5
M	177	4.0	65.9	2.9	179	4.4	166	4.5	210	4.9
N	176	3.9	61.8	2.8	176	4.0	166	4.6	213	4.5
O	71	5.6	29.1	4.0	81	5.1	82	4.9	107	5.4
P	105	12.0	26.3	6.4	84	13.0	118	9.3	193	8.7
Q	367	4.9	45.1	5.9	289	5.5	261	6.2	296	5.5
R	148	5.3	64.3	3.4	151	5.1	140	4.8	97	8.2
S	140	4.0	50.0	2.6	148	4.0	139	4.0	166	4.2
T	191	4.6	66.4	3.7	193	4.6	172	4.2	203	5.6
U	122	4.1	49.9	1.3	127	4.7	130	4.5	95	5.3
V	275	5.4	15.1	5.8	233	5.8	217	5.9	234	5.7
W	173	4.6	63.6	4.3	160	4.9	158	4.6	172	5.2
X	131	6.9	53.0	7.3	132	5.3	121	6.3	116	6.8

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Radiology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	17.1	4.8	100	-	100	-	100	-
A	781	4.7	92.4	4.1	594	6.6	687	6.6	922	7.5
B	31	4.8	3.4	6.3	57	6.4	12	14.4	70	8.4
C	41	5.1	5.3	6.1	52	6.0	14	15.2	48	6.7
D	153	3.0	23.6	4.6	134	3.4	136	3.3	154	4.4
E	169	5.0	23.5	5.4	173	4.5	185	5.5	129	5.7
F	180	6.1	15.3	5.7	206	5.5	57	19.1	176	6.3
G	197	5.6	22.6	5.5	195	5.8	191	6.0	256	7.4
H	351	5.7	46.8	3.9	272	7.7	336	7.1	402	8.4
I	24	5.9	3.1	6.7	30	6.4	11	14.0	40	7.8
J	85	6.8	8.1	6.9	118	6.2	28	17.9	180	8.0
K	268	7.5	34.9	10.5	248	8.8	82	28.1	216	8.4
L	43	5.0	5.1	6.9	53	5.3	16	15.0	56	6.4
M	115	4.2	22.6	6.0	100	3.8	74	6.1	184	6.6
N	181	5.5	27.7	4.2	116	5.9	146	5.8	206	6.4
O	40	5.2	4.7	7.0	48	5.8	14	15.0	46	7.4
P	51	13.4	6.3	13.3	44	14.4	24	21.0	38	14.9
Q	45	5.1	5.4	6.9	48	6.0	15	15.2	51	6.6
R	153	6.0	23.6	6.2	99	7.5	142	6.8	140	7.9
S	301	5.2	41.8	4.3	210	5.9	274	5.9	348	7.1
T	35	5.5	4.5	7.0	38	6.6	13	14.1	49	8.0

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Rheumatology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	17.4	2.5	100	-	100	-	100	-
A	560	5.3	69.4	2.7	559	5.8	242	6.6	571	6.5
B	44	7.0	5.2	6.6	89	7.7	64	9.4	69	9.2
C	346	4.7	54.4	2.4	332	5.4	200	5.7	276	6.2
D	449	4.8	59.4	2.9	428	5.3	245	6.1	409	5.7
E	101	6.6	12.3	5.4	87	8.4	168	7.3	165	8.0
F	89	7.1	14.5	6.3	94	8.7	139	8.5	84	9.2
G	84	7.5	9.5	5.4	82	8.0	155	7.1	164	7.7
H	317	4.8	50.5	2.5	289	6.0	185	5.7	240	6.6
I	152	4.5	19.6	3.1	178	5.0	132	4.4	263	4.7
J	211	4.4	27.5	3.1	222	5.0	148	4.5	233	5.5
K	532	5.6	70.1	2.5	522	5.8	256	6.5	552	6.3
L	63	11.4	8.6	11.1	87	12.1	88	12.2	78	12.4
M	162	4.5	22.1	3.4	165	4.4	133	4.8	164	5.0
N	104	4.9	17.2	3.1	112	4.3	106	4.2	111	5.7
O	327	4.3	54.1	2.2	290	5.4	204	5.5	286	6.0
P	25	8.0	2.9	8.3	42	8.8	23	14.5	38	9.6
Q	46	6.6	5.9	6.9	69	7.0	47	13.7	83	7.9
R	21	8.2	2.5	8.4	34	8.5	22	14.2	39	10.1

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Thoracic and cardiovascular surgery

Service	Work			Time			Mental effort			Technical skill and physical effort			Stress due to risk		
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean
*	100	-	46.9	4.4	100	-	100	-	100	-	100	-	100	-	-
A	862	6.0	282.3	2.5	818	8.6	818	8.6	936	7.2	1045	10.5	1045	10.5	10.5
B	41	5.8	15.7	5.9	44	8.1	44	8.1	45	7.3	55	8.7	55	8.7	8.7
C	13	11.5	9.0	5.2	18	12.5	18	12.5	9	14.3	12	14.9	12	14.9	14.9
D	604	5.9	199.7	2.7	537	8.1	537	8.1	658	8.0	623	8.2	623	8.2	8.2
E	27	13.4	12.8	5.3	32	13.2	32	13.2	18	18.3	25	17.3	25	17.3	17.3
F	43	10.8	36.9	4.8	62	10.8	62	10.8	23	17.4	44	17.5	44	17.5	17.5
G	70	8.0	29.6	5.2	75	7.9	75	7.9	73	7.2	79	11.4	79	11.4	11.4
H	397	5.6	130.5	3.4	351	7.5	351	7.5	419	6.6	369	7.8	369	7.8	7.8
I	512	6.8	166.7	3.3	457	7.6	457	7.6	548	7.6	528	8.2	528	8.2	8.2
J	121	6.7	45.7	4.2	126	7.9	126	7.9	136	7.3	166	8.8	166	8.8	8.8
K	46	10.9	38.4	4.3	65	11.5	65	11.5	23	18.6	44	15.9	44	15.9	15.9
L	37	8.7	25.8	4.5	39	8.6	39	8.6	36	8.5	46	11.4	46	11.4	11.4
M	59	10.0	24.3	6.3	80	10.8	80	10.8	70	9.4	145	12.7	145	12.7	12.7
N	40	11.5	34.8	4.2	53	11.2	53	11.2	21	17.6	43	15.0	43	15.0	15.0
O	319	6.1	97.8	5.6	305	9.3	305	9.3	401	8.9	397	8.6	397	8.6	8.6
P	552	8.1	162.6	4.3	466	8.5	466	8.5	565	8.3	563	8.2	563	8.2	8.2
Q	194	8.9	88.5	9.4	159	10.7	159	10.7	185	9.3	226	10.6	226	10.6	10.6
R	117	7.6	23.6	6.7	120	8.9	120	8.9	123	7.0	152	9.5	152	9.5	9.5
S	613	7.1	250.2	3.3	466	7.5	466	7.5	629	7.1	593	8.7	593	8.7	8.7
T	603	6.4	186.3	3.0	531	9.6	531	9.6	651	7.2	716	10.1	716	10.1	10.1
U	45	10.9	35.6	4.6	65	11.8	65	11.8	24	19.8	45	17.6	45	17.6	17.6

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 31 continued

Intra-service group ratings of the dimensions of work (untransformed scale): Urology

Service	Work		Time		Mental effort		Technical skill and physical effort		Stress due to to risk	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
*	100	-	13.3	6.1	100	-	100	-	100	-
A	2626	7.8	327.9	2.3	2208	8.5	2722	7.9	2808	9.0
B	38	8.7	9.7	5.6	56	9.6	33	13.9	43	15.4
C	562	6.4	37.2	3.9	445	7.1	601	6.9	618	7.8
D	86	7.6	23.7	3.5	134	9.0	76	9.9	160	9.3
E	749	7.7	66.0	3.5	536	7.9	671	6.2	827	9.4
F	114	8.1	31.6	3.2	157	8.9	84	10.2	118	11.3
G	96	8.3	27.0	3.7	134	9.0	76	9.5	162	10.1
H	995	6.5	62.2	2.7	774	8.1	1028	6.4	985	8.3
I	103	2.8	14.4	5.8	105	1.9	104	2.0	111	3.4
J	121	8.0	29.6	4.0	167	8.9	90	11.0	131	9.7
K	471	9.4	34.5	5.7	395	10.9	530	9.9	493	10.9
L	1264	8.1	116.5	4.3	983	9.3	1316	7.9	1385	10.2
M	985	9.6	66.4	4.4	708	11.5	799	10.6	773	11.7
N	904	7.5	75.3	4.1	762	8.8	1136	8.1	964	7.4
O	100	7.6	26.2	3.6	119	8.7	104	8.1	78	10.0
P	125	7.3	29.0	5.5	132	8.6	91	9.5	99	9.6
Q	244	4.5	31.5	4.1	222	6.1	245	5.8	265	4.8
R	47	11.2	15.7	7.6	71	14.0	54	13.5	48	12.1
S	153	8.1	37.9	4.0	217	9.1	205	9.7	112	10.7
T	509	8.2	53.2	3.6	291	13.1	351	11.1	436	10.3
U	274	6.2	41.3	5.6	193	7.2	352	8.3	254	6.7

NOTE: S.E. - Approximate standard error as a percentage of the geometric mean.

Table 32

Multiple linear regressions with estimated population mean rating
of work as the dependent variable

	Model SS	Total SS	Sum of squares	Degree of freedom	Mean square	R- squared
Medical specialties						
Allergy & Immunology	1.5383	1.5518	.01352	13	.00104	.991
Dermatology	1.0196	1.0581	.03846	16	.00240	.964
Family Practice	2.8562	2.8768	.02053	20	.00103	.993
Internal Medicine	1.8205	1.8432	.02274	19	.00120	.988
Pediatrics	1.5996	1.6196	.02000	16	.00125	.988
Psychiatry	0.9353	0.9459	.01055	19	.00056	.989
Rheumatology	3.3745	3.3796	.00504	13	.00039	.999
Medical composite	13.8149	14.0295	.21461	140	.00153	.985
Surgical specialties						
General Surgery	4.9841	5.0053	.02126	20	.00106	.996
Obstetrics & Gynecology	2.6912	2.7285	.03727	21	.00177	.986
Ophthalmology	6.0108	6.0231	.01233	16	.00077	.998
Oral & Maxillofacial Surgery	6.5574	6.5943	.03691	18	.00205	.994
Orthopedic Surgery	7.1653	7.1839	.01858	16	.00116	.997
Otolaryngology	6.4586	6.4968	.03813	16	.00238	.994

Table 32 continued

Multiple linear regressions with estimated population mean rating of work as the dependent variable

	Model SS	Total SS	Sum of squares	Degree of freedom	Mean square	R- squared
Surgical specialties						
Thoracic/Cardiovascular Surgery	6.3045	6.3169	.01242	16	.00078	.998
Urology	5.2793	5.3118	.03244	16	.00203	.994
Surgical composite	55.6532	56.1076	.45445	167	.00272	.992
Other specialties						
Anesthesiology	1.4162	1.4257	.00951	17	.00056	.993
Pathology	1.6262	1.6357	.00946	12	.00079	.994
Radiology	3.3379	3.3624	.02449	16	.00153	.993
Other composite	8.5334	8.5967	.06328	53	.00119	.993
All-specialty composite	77.8724	78.9627	1.09024	368	.00296	.986

Table 33

Predicting the mean ratings of work: Results from a regression of the mean ratings of the dimensions of work on the mean ratings of intra-service work

Specialty	Regression coefficients (t-statistics in parentheses)				R-square
	Intercept	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk
Medical Specialties					
Allergy and Immunology	-0.019 (-0.11)	0.425** (5.88)	0.180* (2.07)	0.576** (6.34)	-0.001 (-0.01)
Dermatology	0.080 (0.35)	0.398* (3.46)	0.242 (1.24)	0.405* (3.15)	0.121 (0.80)
Family Practice	0.216 (1.66)	0.492** (5.15)	0.081 (0.71)	0.242 (2.78)	0.291 (3.48)
Internal Medicine	0.105 (0.81)	0.505** (5.93)	0.114 (0.88)	0.183 (2.50)	0.347* (3.55)
Pediatrics	-0.284* (-2.97)	0.126 (2.41)	0.669** (5.50)	0.619** (8.61)	-0.212 (-2.33)
Psychiatry	-0.417* (-3.56)	0.264* (2.88)	0.182 (1.19)	0.643* (3.25)	0.162 (2.48)
Rheumatology	0.298 (2.95)	0.577** (9.85)	0.208 (2.81)	0.026 (0.56)	0.270* (5.16)
Medical composite	-0.255** (-6.66)	0.332** (12.04)	0.359** (8.44)	0.351** (11.42)	0.146** (4.64)

Table 33 continued

Predicting the mean ratings of work: Results from a regression of the mean ratings of the dimensions of work on the mean ratings of intra-service work

Specialty	Regression coefficients (t-statistics in parentheses)				R-square
	Intercept	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk
Invasive Specialties					
General Surgery	-0.156* (-3.33)	0.060 (0.78)	0.563* (3.73)	0.719* (15.99)	-0.246 (-2.43)
Oral and Maxillo-facial Surgery	0.023 (0.32)	0.284* (3.87)	-0.112 (-0.72)	1.109** (10.18)	-0.171 (-1.42)
Obstetrics and Gynecology	0.055 (0.52)	0.306** (6.74)	0.294 (2.30)	0.491** (7.00)	-0.013 (-0.15)
Ophthalmology	-0.042 (-0.56)	0.168* (3.81)	0.021 (0.13)	0.664** (6.17)	0.237 (2.18)
Orthopedic Surgery	-0.196* (-3.50)	-0.014 (-0.19)	0.485* (3.11)	0.702** (10.20)	-0.089 (-0.84)
Otolaryngology	-0.099 (-1.15)	0.108 (1.26)	0.177 (1.05)	0.876** (5.83)	-0.105 (-0.62)
Thoracic and Cardiovascular Surg	-0.029 (-0.62)	0.158 (2.68)	0.626** (5.54)	0.471** (6.79)	-0.206 (-2.08)
Urology	0.040 (0.42)	0.149 (1.54)	0.169 (0.97)	0.759** (7.50)	-0.029 (-0.22)
Invasive composite	-0.167** (-5.24)	0.174** (6.46)	0.358** (5.69)	0.632** (17.71)	-0.066 (-1.36)

Table 33 continued

Predicting the mean ratings of work: Results from a regression of the mean ratings of the dimensions of work on the mean ratings of intra-service work

Specialty	Regression coefficients (t-statistics in parentheses)				R-square
	Intercept	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk
Other Specialties					
Anesthesiology	-0.127 (-2.10)	0.304** (8.08)	0.550* (3.58)	0.228 (1.82)	0.028 (0.14)
Pathology	0.231 (2.48)	0.451** (7.54)	0.414* (4.99)	0.191* (3.79)	0.108 (1.52)
Radiology	0.374* (4.29)	0.544** (5.34)	0.525** (5.64)	0.038 (0.56)	-0.043 (-0.50)
Other composite	0.222** (5.07)	0.372** (11.47)	0.592** (11.24)	0.135** (4.54)	-0.024 (-0.49)
All-specialty composite	-0.248** (-10.17)	0.225** (11.82)	0.458** (12.57)	0.385** (18.47)	0.077* (2.64)

NOTE: * statistically significant $p < 0.05$

** statistically significant $p < 0.01$

Table 34

Predicting the individual ratings of
intra-service work: Results from seven models

Allergy and Immunology						
Dummies			Degrees of freedom		Sum of squares	
Model	Physicians	Services	Dimensions	Model	Error	R-square
1	*			111	1670	0.188
2		*		17	1764	0.521
3			*	4	1777	0.729
4	*	*		128	1653	0.707
5	*		*	115	1666	0.810
6		*	*	21	1760	0.754
7	*	*	*	132	1649	0.830
Interaction SS not accounted for ¹ :				4	35.8	
Anesthesiology						
Dummies			Degrees of freedom		Sum of squares	
Model	Physicians	Services	Dimensions	Model	Error	R-square
1	*			116	1317	0.165
2		*		21	2412	0.634
3			*	4	2429	0.815
4	*	*		137	2296	0.785
5	*		*	120	2313	0.861
6		*	*	25	2408	0.826
7	*	*	*	141	2292	0.872
Interaction SS not accounted for ¹ :				4	21.4	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Dermatology		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			105	1791	40.1	174.6	0.187
2		*		20	1876	103.1	111.6	0.480
3			*	4	1892	142.3	72.5	0.663
4	*	*		125	1771	143.7	71.0	0.670
5	*		*	109	1787	163.3	51.5	0.760
6		*	*	24	1872	151.0	63.7	0.703
7	*	*	*	129	1767	170.0	45.2	0.790
Interaction SS not accounted for ¹ :				4			25.8	
Family Practice								
Model	Physicians	Services	Dimensions	Degrees of freedom		Sum of squares		R-square
				Model	Error	Model	Error	
1	*			109	2334	47.5	327.1	0.127
2		*		24	2419	245.5	129.1	0.656
3			*	4	2439	294.2	80.3	0.786
4	*	*		133	2310	287.8	86.8	0.768
5	*		*	113	2330	315.3	59.3	0.842
6		*	*	28	2415	301.5	73.0	0.805
7	*	*	*	137	2306	321.3	53.2	0.858
Interaction SS not accounted for ¹ :				4			33.6	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

General Surgery		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			102	2032	112.2	572.9	0.164
2		*		24	2110	439.8	245.3	0.642
3			*	4	2130	546.5	138.6	0.798
4	*	*		126	2008	553.0	132.1	0.807
5	*		*	106	2028	590.1	95.0	0.861
6		*	*	28	2106	561.8	123.3	0.820
7	*	*	*	130	2004	607.6	77.5	0.887
Interaction SS not accounted for ¹ :					4		54.6	
Internal Medicine		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			100	2251	42.8	256.0	0.143
2		*		23	2328	177.3	121.5	0.594
3			*	4	2347	223.7	75.2	0.749
4	*	*		123	2228	219.0	79.8	0.733
5	*		*	104	2247	244.5	54.3	0.818
6		*	*	27	2324	231.5	67.3	0.775
7	*	*	*	127	2224	249.8	49.1	0.836
Interaction SS not accounted for ¹ :					4		30.7	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Obstetrics and Gynecology						
Model	Dummies		Degrees of freedom		Sum of squares	
	Physicians	Services	Model	Error	Model	R-square
1	*		88	2029	94.6	0.213
2		*	25	2092	240.8	0.543
3			4	2113	321.8	0.726
4	*	*	113	2004	333.8	0.753
5	*		92	2025	368.9	0.832
6		*	29	2088	331.8	0.749
7	*	*	117	2000	376.9	0.850
Interaction SS not accounted for ¹ :				4	43.1	
Ophthalmology						
Model	Dummies		Degrees of freedom		Sum of squares	
	Physicians	Services	Model	Error	Model	R-square
1	*		97	1643	73.3	0.109
2		*	20	1720	491.4	0.731
3			4	1736	596.6	0.888
4	*	*	117	1623	563.2	0.838
5	*		101	1639	621.0	0.924
6		*	24	1716	602.6	0.897
7	*	*	121	1619	625.6	0.931
Interaction SS not accounted for ¹ :				4	62.5	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Oral and Maxillofacial Surgery						
Dummies						
Model	Physicians	Services	Dimensions	Degrees of freedom		R-square
				Model	Error	
1	*			116	2369	0.092
2		*		22	2463	0.745
3			*	4	2481	0.836
4	*	*		138	2347	0.831
5	*		*	120	2365	0.872
6		*	*	26	2459	0.863
7	*	*	*	142	2343	0.896
Interaction SS not accounted for ¹ :				4	63.3	
Orthopedic Surgery						
Dummies						
Model	Physicians	Services	Dimensions	Degrees of freedom		R-square
				Model	Error	
1	*			106	1998	0.190
2		*		20	2084	0.668
3			*	4	2100	0.856
4	*	*		126	1978	0.852
5	*		*	110	1994	0.914
6		*	*	24	2080	0.864
7	*	*	*	130	1974	0.924
Interaction SS not accounted for ¹ :				4	76.5	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Otolaryngology		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			104	1813	57.9	632.4	0.084
2		*		20	1897	532.6	157.6	0.772
3			*	4	1913	593.9	96.3	0.861
4	*	*		124	1793	581.4	108.8	0.842
5	*		*	108	1809	620.4	69.8	0.899
6		*	*	24	1893	608.7	81.5	0.882
7	*	*	*	128	1789	632.0	58.2	0.916
Interaction SS not accounted for ¹ :				4			50.6	
Pathology		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			114	1700	87.4	260.1	0.252
2		*		16	1798	174.6	172.9	0.503
3			*	4	1810	249.7	97.8	0.719
4	*	*		130	1684	260.0	87.5	0.748
5	*		*	118	1696	295.0	52.5	0.849
6		*	*	20	1794	256.3	91.2	0.738
7	*	*	*	134	1680	298.5	49.0	0.859
Interaction SS not accounted for ¹ :				4			38.5	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Pediatrics						
<u>Dummies</u>			<u>Degrees of freedom</u>		<u>Sum of squares</u>	
<u>Model</u>	<u>Physicians</u>	<u>Services</u>	<u>Dimensions</u>	<u>Model</u>	<u>Error</u>	<u>R-square</u>
1	*			102	1982	0.150
2		*		20	2064	0.584
3			*	4	2080	0.751
4	*	*		122	1962	0.737
5	*		*	106	1978	0.813
6		*	*	24	2060	0.782
7	*	*	*	126	1958	0.840
Interaction SS not accounted for ¹ :				4	28.0	
Psychiatry						
<u>Dummies</u>			<u>Degrees of freedom</u>		<u>Sum of squares</u>	
<u>Model</u>	<u>Physicians</u>	<u>Services</u>	<u>Dimensions</u>	<u>Model</u>	<u>Error</u>	<u>R-square</u>
1	*			99	2174	0.146
2		*		23	2250	0.477
3			*	4	2269	0.705
4	*	*		122	2151	0.622
5	*		*	103	2170	0.771
6		*	*	27	2246	0.718
7	*	*	*	126	2147	0.784
Interaction SS not accounted for ¹ :				4	30.9	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Radiology		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			116	2044	55.8	410.1	0.120
2		*		20	2140	342.1	123.8	0.734
3			*	4	2156	382.3	83.6	0.821
4	*	*		136	2024	390.9	75.0	0.839
5	*		*	120	2040	414.0	51.8	0.889
6		*	*	24	2136	395.9	69.9	0.850
7	*	*	*	140	2020	421.5	44.3	0.905
Interaction SS not accounted for ¹ :				4			30.7	
Rheumatology		Dummies		Degrees of freedom		Sum of squares		R-square
Model	Physicians	Services	Dimensions	Model	Error	Model	Error	
1	*			118	1925	67.9	474.6	0.125
2		*		17	2026	391.2	151.4	0.721
3			*	4	2039	448.5	94.0	0.827
4	*	*		135	1908	457.3	85.2	0.843
5	*		*	122	1921	486.1	56.4	0.896
6		*	*	21	2022	456.7	85.9	0.842
7	*	*	*	139	1904	491.4	51.2	0.906
Interaction SS not accounted for ¹ :				4			34.0	

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 34 continued

Predicting the individual ratings of
intra-service work: Results from seven models

Thoracic and Cardiovascular Surgery									
<u>Dummies</u>				<u>Degrees of freedom</u>		<u>Sum of squares</u>		<u>R-square</u>	
<u>Model</u>	<u>Physicians</u>	<u>Services</u>	<u>Dimensions</u>	<u>Model</u>	<u>Error</u>	<u>Model</u>	<u>Error</u>		
1	*			95	1734	99.0	646.2	0.133	
2		*		20	1809	536.7	208.5	0.720	
3			*	4	1825	636.3	108.9	0.854	
4	*	*		115	1714	630.6	114.6	0.846	
5	*		*	99	1730	667.6	77.5	0.896	
6		*	*	24	1805	641.1	104.1	0.860	
7	*	*	*	119	1710	673.6	71.5	0.904	
Interaction SS not accounted for ¹ :				4			43.1		
Urology									
<u>Dummies</u>				<u>Degrees of freedom</u>		<u>Sum of squares</u>		<u>R-square</u>	
<u>Model</u>	<u>Physicians</u>	<u>Services</u>	<u>Dimensions</u>	<u>Model</u>	<u>Error</u>	<u>Model</u>	<u>Error</u>		
1	*			114	1982	92.1	661.6	0.122	
2		*		20	2076	548.9	204.8	0.728	
3			*	4	2092	649.1	104.5	0.861	
4	*	*		134	1962	629.1	124.5	0.835	
5	*		*	118	1978	680.1	73.5	0.902	
6		*	*	24	2072	661.0	92.7	0.877	
7	*	*	*	138	1958	689.0	64.7	0.914	
Interaction SS not accounted for ¹ :				4			59.8		

¹Difference between Model 7 and Model 4 degrees of freedom and sum of squares.

Table 35

Predicting the individual ratings of work: Results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician and service

INDIVIDUAL RATINGS				
Regression coefficients (t-statistics in parentheses) ¹				
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk R-squared
Medical specialties				
Allergy and Immunology	0.209 (11.11)	0.367 (15.91)	0.149 (7.45)	0.142 (6.85) 0.830
Dermatology	0.273 (13.27)	0.273 (12.12)	0.136 (6.46)	0.163 (7.44) 0.790
Family Practice	0.414 (27.09)	0.253 (14.69)	0.239 (15.63)	0.170 (12.27) 0.842
Internal Medicine	0.342 (16.63)	0.314 (15.94)	0.083 (7.13)	0.115 (6.85) 0.836
Pediatrics	0.199 (11.85)	0.280 (13.93)	0.242 (13.55)	0.127 (6.96) 0.840
Psychiatry	0.296 (14.83)	0.325 (14.96)	0.209 (9.80)	0.110 (7.13) 0.784
Rheumatology	0.300 (14.52)	0.302 (15.51)	0.078 (6.00)	0.120 (7.04) 0.906

¹All regression coefficients are statistically significant at the 1% level.

Table 35 continued

Predicting the individual ratings of work: Results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician and service

INDIVIDUAL RATINGS

Regression coefficients (t-statistics in parentheses) ¹				
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk
Invasive specialties				
General Surgery	0.228 (8.69)	0.241 (12.00)	0.249 (16.00)	0.101 (5.62)
Obstetrics and Gynecology	0.167 (8.64)	0.279 (13.41)	0.254 (14.99)	0.110 (5.81)
Ophthalmology	0.154 (6.18)	0.321 (14.33)	0.354 (17.64)	0.083 (5.00)
Oral and Maxillo-facial Surgery	0.159 (6.53)	0.229 (11.42)	0.293 (15.83)	0.096 (5.73)
Orthopedic Surgery	0.137 (6.14)	0.240 (11.16)	0.365 (20.04)	0.102 (5.47)
Otolaryngology	0.139 (5.42)	0.232 (12.42)	0.331 (17.34)	0.091 (5.71)
Thoracic and Cardiovascular Surgery	0.155 (4.92)	0.266 (13.04)	0.271 (16.12)	0.063 (3.76)
Urology	0.151 (5.30)	0.243 (12.28)	0.329 (17.44)	0.116 (6.70)

¹All regression coefficients are statistically significant at the 1% level.

Table 35 continued

Predicting the individual ratings of work: Results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician and service

INDIVIDUAL RATINGS				
Regression coefficients (t-statistics in parentheses) ¹				
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk
Other Specialties				
Anesthesiology	0.125 (6.57)	0.305 (12.91)	0.207 (10.37)	0.207 (10.45)
Pathology	0.252 (11.17)	0.124 (9.02)	0.367 (15.16)	0.185 (8.71)
Radiology	0.152 (8.41)	0.352 (19.17)	0.112 (12.55)	0.122 (7.89)
				0.872
				0.859
				0.905

¹All regression coefficients are statistically significant at the 1% level.

Table 36

Predicting the individual ratings of work: results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician

INDIVIDUAL RATINGS						
Regression Coefficients (t-statistics in parentheses) ¹						
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk	Residual degrees of freedom	R-squared
Medical Specialties						
Allergy & Immunology	0.331 (21.39)	0.390 (19.26)	0.217 (11.09)	0.149 (8.07)	1666	0.810
Dermatology	0.352 (21.94)	0.271 (12.56)	0.203 (10.66)	0.228 (11.37)	1787	0.760
Family Practice	0.414 (27.09)	0.253 (14.69)	0.239 (15.63)	0.170 (12.27)	2330	0.842
Internal Medicine	0.467 (32.18)	0.312 (16.90)	0.115 (10.45)	0.173 (11.35)	2247	0.818
Pediatrics	0.268 (22.34)	0.347 (18.00)	0.350 (21.90)	0.127 (8.08)	1978	0.813
Psychiatry	0.370 (24.35)	0.345 (16.17)	0.235 (10.98)	0.154 (11.61)	2170	0.771
Rheumatology	0.484 (32.76)	0.337 (18.24)	0.089 (7.22)	0.160 (9.88)	1921	0.896

¹All regression coefficients are statistically significant at the 1% level.

Table 36 continued

Predicting the individual ratings of work: results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician

INDIVIDUAL RATINGS						
Regression Coefficients (t-statistics in parentheses) ¹						
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk	Residual degrees of freedom	R-squared
Invasive specialties						
General Surgery	0.337 (17.62)	0.236 (10.99)	0.417 (29.03)	0.118 (6.36)	2028	0.861
Obstetrics/Gynecology	0.278 (21.51)	0.302 (14.75)	0.326 (21.52)	0.126 (7.26)	2025	0.832
Ophthalmology	0.202 (11.73)	0.335 (14.80)	0.437 (22.79)	0.135 (8.46)	1639	0.924
Oral-Maxillofacial Surgery	0.366 (21.38)	0.210 (9.98)	0.455 (24.82)	0.115 (6.64)	2365	0.872
Orthopedic Surgery	0.239 (14.27)	0.252 (11.59)	0.469 (27.87)	0.132 (7.31)	1994	0.914
Otolaryngology	0.248 (14.65)	0.221 (11.31)	0.471 (25.71)	0.126 (7.53)	1809	0.899
Thoracic & Cardiovascular Surgery	0.304 (15.70)	0.308 (15.21)	0.343 (22.81)	0.083 (4.94)	1730	0.896
Urology	0.226 (11.30)	0.245 (12.15)	0.469 (27.98)	0.135 (7.87)	1978	0.902

¹All regression coefficients are statistically significant at the 1% level.

Table 36 continued

Predicting the individual ratings of work: results from a regression of the individual ratings of the dimensions of work on the individual ratings of intra-service work, controlling for physician

INDIVIDUAL RATINGS						
Regression Coefficients (t-statistics in parentheses) ¹						
Specialty	Time	Mental effort and judgment	Technical skill and physical effort	Stress due to risk	Residual degrees of freedom	R-squared
Other specialties						
Anesthesiology	0.289 (28.52)	0.354 (16.38)	0.219 (11.72)	0.212 (10.97)	2313	0.861
Pathology	0.389 (22.38)	0.157 (12.51)	0.410 (18.97)	0.161 (8.40)	1696	0.849
Radiology	0.315 (21.92)	0.414 (24.16)	0.141 (16.15)	0.132 (8.95)	2040	0.889

¹All regression coefficients are statistically significant at the 1% level.

Table 37
Predicting group ratings of work

<u>Specialty</u>	<u>R-squared</u>	
	<u>Four predictors</u>	<u>Composite predictor</u>
Medical specialties		
Allergy & Immunology	.991	.599
Dermatology	.964	.150
Family Practice	.993	.461
Internal Medicine	.988	.643
Pediatrics	.988	.435
Psychiatry	.989	¹ .000
Rheumatology	.999	.868
Surgical specialties		
General Surgery	.996	.794
Obstetrics & Gynecology	.986	.276
Ophthalmology	.998	.919
Oral & Maxillofacial Surger	.994	.907
Orthopedic Surgery	.997	.931
Otolaryngology	.994	.925
Thoracic/Cardiovascular Surgery	.998	.933
Urology	.994	.359

¹ Less than .001.

Table 37 continued
Predicting group ratings of work

<u>Specialty</u>	<u>R-squared</u>	
	<u>Four predictors</u>	<u>Composite predictor</u>
Other Specialties		
Anesthesiology	.993	.343
Pathology	.994	.782
Radiology	.993	.756

Table 38
Analysis of inhomogeneity of regression

	<u>Sum of squares</u>	<u>Degree of freedom</u>	<u>Mean square</u>	<u>F- statistic</u>
Medical specialties				
Inhomogeneity	.08377	24	.003490	3.09**
Residual	.13084	116	.001127	
Surgical specialties				
Inhomogeneity	.24511	28	.008754	5.81**
Residual	.20934	139	.001506	
Other specialties				
Inhomogeneity	.01982	8	.002478	2.57*
Residual	.04346	45	.000966	
Between surgical, medical, and other specialties				
Inhomogeneity	.35790	8	.04474	35.0**
Residual	.38364	300	.001279	

* Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 39

Board certification percentages for RBRVS national survey sample
and physicians in the United States

<u>Specialty</u>	<u>Percentage of RBRVS Sample</u>	<u>Percentage of United States Physician Population</u>
Allergy/Immunology	87	74
Anesthesiology	78	47
Dermatology	81	79
Family Practice	76	77
General Surgery	76	55
Internal Medicine	75	51
Obstetrics/Gynecology	77	61
Ophthalmology	83	73
Oral and Maxillofacial Surgery	69	--
Orthopedics	83	66
Otolaryngology	83	70
Pathology	85	75
Pediatrics	76	57
Psychiatry	76	49
Radiology	87	88

Table 39 continued

Board certification percentages for RBRVS national survey sample
and physicians in the United States

<u>Specialty</u>	<u>Percentage of RBRVS Sample</u>	<u>Percentage of United States Physician Population</u>
Rheumatology	88	---
Thoracic/Cardiovascular Surgery	90	88
Urology	82	72

NOTE: Board-certification percentages were not available for non-federal patient care physicians and are reported here for all United States physicians.

SOURCE: American Medical Association. Physician Characteristics and Distribution in the U.S., 1987.

Table 40

Comparison of physicians in national survey sample and nonfederal patient care physicians
in nine United States geographic regions

Specialty	East north central		East south central		Mid Atlantic		Mountain		New England	
	Surveyed	United States	Surveyed	United States	Surveyed	United States	Surveyed	United States	Surveyed	United States
Allergy/Immunology	15.0%	15.9%	3.5%	3.9%	19.5%	18.8%	6.2%	5.7%	10.6%	6.9%
Anesthesiology	14.5	16.0	6.8	4.7	20.5	17.5	9.4	5.8	6.0	6.5
Dermatology	21.7	14.3	4.7	4.4	20.8	17.6	2.8	4.8	5.7	6.3
Family Practice	17.3	17.3	4.5	6.3	13.6	11.7	10.0	6.5	6.4	4.0
General Surgery	17.1	16.4	4.8	6.1	12.4	18.5	4.8	4.8	6.7	6.4
Internal Medicine	16.5	15.8	5.8	4.5	21.4	22.0	6.8	4.0	7.8	8.0
Obstetrics/Gyn	16.0	15.1	4.0	5.3	17.0	18.1	3.0	4.9	6.0	6.0
Ophthalmology	20.0	14.5	1.9	4.7	21.9	19.1	5.7	5.3	4.8	6.2
Oral/ Max Surgery	12.7	---	3.4	---	15.3	---	8.5	---	11.0	---
Orthopedic Surgery	14.7	14.1	3.7	5.1	18.3	15.4	5.5	5.8	7.3	6.9
Otolaryngology	15.7	14.1	5.6	6.1	17.6	16.0	5.6	5.2	8.3	6.2
Pathology	17.6	17.9	8.4	5.6	15.1	17.6	7.6	4.6	7.6	6.5
Pediatrics	16.2	15.1	6.7	4.8	14.3	20.8	2.9	4.5	11.4	7.2
Psychiatry	9.6	12.9	1.9	3.0	24.0	25.0	3.8	4.0	11.5	9.6
Radiology	15.0	16.2	5.8	5.7	19.2	17.7	6.7	4.7	7.5	6.7

Table 40 continued

Comparison of physicians in national survey sample and nonfederal patient care physicians
in nine United States geographic regions

Specialty	East north central		East south central		Mid Atlantic		Mountain		New England	
	Surveyed	United States	Surveyed	United States	Surveyed	United States	Surveyed	United States	Surveyed	United States
Rheumatology	12.6	---	5.0	---	18.5	---	2.5	---	6.7	---
Thoracic Surgery	17.8	16.3	7.9	6.3	14.9	19.4	4.0	3.8	5.0	6.4
Urology	13.9	15.0	2.6	6.0	20.9	18.2	8.7	4.5	5.2	5.5

Table 40 continued

Comparison of physicians in national survey sample and nonfederal patient care physicians
in nine United States geographic regions

Specialty	Pacific		South Atlantic		West north central		West south central	
	Surveyed	U.S.	Surveyed	U.S.	Surveyed	U.S.	Surveyed	U.S.
Allergy/Immunology	11.5	18.2	15.0	13.6	6.2	6.3	12.4	10.7
Anesthesiology	12.8	18.7	16.2	15.8	6.0	5.6	7.7	9.3
Dermatology	17.0	20.8	15.1	17.1	2.8	5.3	9.4	9.3
Family Practice	13.6	16.8	10.0	16.6	13.6	10.2	10.9	10.5
General Surgery	16.2	14.9	18.1	17.0	7.6	6.7	12.4	9.3
Internal Medicine	14.6	16.7	12.6	16.0	7.8	5.9	6.8	7.2
Obstetrics/Gyn	21.0	17.0	20.0	18.4	4.0	5.3	9.0	9.8
Ophthalmology	15.2	16.6	16.2	17.2	7.6	6.2	6.7	9.5
Oral/Max Surgery	13.6	---	16.1	---	8.5	---	11.0	---
Orthopedic Surgery	11.9	19.7	22.0	17.3	10.0	6.1	6.4	9.6
Otolaryngology	16.7	19.1	14.8	17.3	3.7	6.0	12.0	10.6
Pathology	11.8	14.5	16.0	16.2	4.2	7.6	11.8	9.6
Pediatrics	19.0	17.1	18.1	16.6	4.8	5.2	6.7	8.6
Psychiatry	24.0	18.5	16.3	15.9	3.8	4.4	4.8	6.7

Table 40 continued

Comparison of physicians in national survey sample and nonfederal patient care physicians
in nine United States geographic regions

Specialty	Pacific		South Atlantic		West north central		West south central	
	Surveyed	U.S.	Surveyed	U.S.	Surveyed	U.S.	Surveyed	U.S.
Radiology	10.8	16.2	18.3	16.9	7.5	6.6	9.2	9.5
Rheumatology	15.1	---	22.7	---	8.4	---	8.4	---
Thoracic Surgery	14.9	15.7	19.9	16.8	9.0	5.9	6.9	9.4
Urology	8.7	15.8	20.9	18.8	6.1	6.1	13.0	10.1

SOURCE: American Medical Association. Physician Characteristics and Distribution in the United States, 1987.

Table 41

Comparisons of national survey respondents with non-respondents
for board certification and geographic region¹

	<u>Board certification</u>	<u>Geographic region</u>
<u>Specialty</u>	<u>Chi square statistic</u>	<u>Chi square statistic</u>
Allergy and Immunology	1.48	8.44
Anesthesiology	1.69	8.61
Dermatology	1.57	7.54
Family Practice	0.16	7.27
General Surgery	0.55	6.28
Internal Medicine	0.36	6.39
Obstetrics\Gynecology	0.00	9.16
Ophthalmology	0.16	10.83
Oral and Maxillofacial Surg	0.00	3.10
Orthopedic Surgery	0.03	10.02
Otolaryngology	0.23	2.58
Pathology	5.87*	11.95
Pediatrics	1.03	10.60
Psychiatry	0.65	16.79*
Radiology	0.33	3.51
Rheumatology	0.00	8.73
Thoracic Cardiovascular Surg	0.10	3.64
Urology	0.19	6.96

¹ The comparison is the results of a chi-square test of the distribution of respondents and non-respondents by board certification status and geographic location (9 regions).

* Statistically significant at the 5% level.

Table 42

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Allergy and immunology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	103	0.030	2.433**	0.096	0.017	0.0029	0.020	-0.030	-0.003	-0.062
B	108	0.036	2.265**	-0.064	-0.130	0.0002	-0.012	-0.022	-0.050	-0.022
C	101	0.060	2.034**	0.125	0.056	0.0028	0.015	0.022	0.101	0.010
D	103	0.128	1.948**	0.206*	-0.035	0.0064	-0.003	0.101	0.160*	0.008
E	105	0.040	2.551**	0.075	0.064	0.0014	-0.049	0.015	0.025	0.053
F	111	0.047	2.442**	0.083	0.020	0.0029	-0.052	0.052	0.047	-0.027
G	103	0.020	1.822**	-0.017	-0.079	0.0012	-0.008	-0.127	-0.091	-0.101
H	111	0.035	1.783**	0.139	0.034	0.0026	0.004	-0.070	0.015	-0.047
I	40	0.355*	1.598**	0.592**	-0.071	0.0173	-0.077	0.061	0.147	-0.022
J	60	0.092	2.156**	0.208	0.144	-0.0003	0.103	-0.039	0.167	0.067
K	105	0.126	1.940**	0.093	0.142	0.0061	-0.000	-0.178	0.056	0.132
L	109	0.051	2.409**	0.118	0.043	0.0018	0.006	-0.028	0.064	0.023
M	101	0.084	1.958**	0.037	0.030	0.0060	0.106	-0.041	0.012	0.106
N	112	0.060	2.358	0.109	0.051	0.0044	-0.029	0.062	0.061	0.002
O	111	0.019	2.384**	-0.014	-0.041	-0.0007	-0.005	-0.002	-0.001	0.057
P	112	0.015	2.389**	-0.018	0.046	0.0007	-0.030	-0.013	0.020	0.025
Q	88	0.020	1.897**	0.068	-0.049	0.0004	-0.074	-0.045	-0.104	-0.086
R	99	0.070	2.482**	0.049	0.100	0.0029	-0.036	0.040	0.086	0.106

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Anesthesiology

<u>Task</u>	<u>N¹</u>	<u>R-Square</u>	<u>Intercept</u>	<u>Board certified</u>	<u>Salaried or fee for service</u>	<u>Years since medical school</u>	<u>Residency program in hospital</u>	<u>Region</u>		
								<u>Midwest</u>	<u>South</u>	<u>West</u>
A	86	0.115	2.840**	0.019	0.003	-0.0024	0.067	0.066	-0.078	-0.010
B	116	0.078	1.923**	-0.007	-0.001	-0.0019	0.089	-0.019	-0.094	0.020
C	117	0.039	2.430**	-0.006	0.016	-0.0005	0.050	0.011	-0.047	-0.036
D	116	0.076	2.575**	-0.032	-0.036	-0.0014	0.049	0.027	-0.061	0.008
E	109	0.070	2.047**	-0.010	0.036	0.0026	0.029	-0.032	-0.040	0.051
F	114	0.116	2.211**	0.031	0.018	0.0035	0.026	-0.016	-0.057	0.012
G	116	0.048	2.395**	-0.004	0.027	0.0021	0.066	0.027	-0.015	0.016
H	100	0.079	2.172**	0.009	-0.006	0.0016	0.032	0.007	-0.114	-0.152*
I	112	0.060	1.998**	-0.000	0.014	0.0013	-0.005	-0.019	-0.016	0.050
J	116	0.037	2.335**	0.014	0.019	0.0001	0.056	0.020	-0.027	0.009
K	113	0.093	2.689**	0.076	-0.004	-0.0026	0.074	0.049	-0.029	-0.006
L	116	0.040	1.848**	0.036	-0.003	-0.0016	-0.011	-0.029	-0.041	0.036
M	111	0.083	2.224**	-0.127	0.009	0.0030	0.083	-0.031	-0.083	0.040
N	98	0.043	2.267**	0.019	-0.041	-0.0010	0.055	0.020	-0.073	-0.019
O	117	0.072	2.256**	-0.008	-0.006	0.0012	0.048	-0.003	-0.082	-0.020
P	116	0.071	2.531**	0.038	0.023	-0.0021	0.076*	0.002	-0.039	-0.026
Q	109	0.088	2.026**	0.038	-0.078*	0.0003	-0.000	0.006	0.019	0.082
R	115	0.044	2.029**	0.028	0.007	0.0018	0.084	0.004	-0.021	-0.011
S	116	0.057	2.223**	0.014	0.041	-0.0000	0.026	0.040	-0.051	-0.029
T	102	0.087	2.524**	0.118	0.038	-0.0020	0.055	0.087	-0.005	0.022
U	112	0.037	2.381**	-0.002	0.001	-0.0011	0.049	0.053	-0.001	0.001
V	107	0.079	2.069**	-0.002	-0.005	0.0013	0.104	-0.038	-0.122	-0.053

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Dermatology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	102	0.054	2.470**	0.040	0.021	0.0001	0.036	0.014	0.036	-0.108
B	99	0.080	2.060**	0.010	0.159	-0.0014	-0.006	0.050	-0.081	-0.096
C	105	0.019	2.381**	0.009	-0.026	0.0008	-0.049	0.011	-0.008	-0.008
D	91	0.064	2.094**	0.050	-0.001	0.0009	-0.008	-0.042	-0.159	-0.181
E	105	0.061	2.310**	0.003	0.008	0.0024	-0.038	-0.009	-0.089	-0.051
F	105	0.128	2.042**	-0.111	0.138	-0.0060	-0.037	0.111	-0.133	-0.087
G	104	0.112	1.896**	-0.004	0.017	0.0012	0.010	0.103**	0.092*	0.019
H	101	0.083	2.134**	-0.094	-0.114	0.0016	-0.037	0.102	-0.111	-0.162
I	29	0.126	2.379**	0.105	-0.026	-0.0067	0.126	-0.164	-0.022	-0.064
J	103	0.030	2.310**	0.001	-0.026	0.0018	-0.031	0.058	0.026	0.018
K	53	0.148	2.336**	-0.237*	-0.049	0.0018	-0.063	0.057	-0.111	-0.006
L	100	0.131	2.222**	0.006	0.149	-0.0036	0.025	0.061	-0.063	-0.045
M	101	0.153*	2.419**	0.021	0.268**	-0.0055	0.019	0.066	-0.111	-0.009
N	96	0.134	2.504**	0.151	0.244*	-0.0061	0.025	0.001	-0.065	-0.026
O	98	0.079	2.034**	-0.045	0.198*	-0.0023	0.037	0.049	-0.031	-0.038
P	103	0.087	2.359**	0.135*	0.071	0.0003	-0.074	0.028	0.027	0.027
Q	23	0.267	2.895**	-0.238	-0.070	-0.0073	-0.185	-0.056	-0.314	0.107
R	105	0.047	2.424**	0.083	-0.038	-0.0002	-0.051	-0.044	-0.041	0.014
S	58	0.065	2.226**	0.107	-0.057	0.0082	0.024	-0.067	-0.082	-0.025
T	105	0.038	2.480**	0.059	0.008	-0.0029	-0.007	-0.032	-0.018	0.026
U	95	0.138	2.299**	0.142	0.239*	-0.0042	0.036	0.023	-0.076	-0.037

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Family practice

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	105	0.043	2.534**	0.025	0.031	-0.0027	-0.014	0.043	0.002	-0.035
B	107	0.129*	1.740**	-0.045	0.079	0.0017	0.068	-0.079	0.057	-0.071
C	107	0.185**	2.288**	-0.119	0.118*	-0.0019	0.033	-0.027	0.121	-0.054
D	43	0.248	2.606**	-0.029	0.309	0.0064	-0.014	-0.347	-0.088	-0.208
E	89	0.063	2.246**	-0.033	0.071	-0.0025	0.058	0.006	0.080	-0.000
F	102	0.147*	2.285**	-0.154	0.144*	-0.0036	0.050	0.006	0.088	0.016
G	31	0.459*	2.781**	0.032	0.299	0.0085	-0.214	-0.390*	-0.099	-0.276
H	67	0.159	3.140**	0.349*	0.120	0.0007	-0.005	-0.068	-0.208	-0.241
I	106	0.031	1.529**	-0.011	-0.007	-0.0007	0.005	0.025	0.137	-0.004
J	105	0.051	1.588**	0.122	0.023	-0.0028	0.090	-0.094	0.026	-0.112
K	81	0.060	2.406**	0.082	0.043	-0.0024	-0.038	0.000	0.068	-0.032
L	108	0.179*	1.869**	-0.050	0.178**	-0.0005	0.011	-0.017	0.032	-0.029
M	109	0.120	1.834**	-0.107	0.150	-0.0012	0.018	0.025	0.096	0.023
N	108	0.090	2.091**	-0.056	0.073	0.0001	0.006	-0.001	0.071	-0.028
O	106	0.047	2.166**	-0.032	0.029	-0.0005	-0.012	-0.018	-0.057	0.017
P	108	0.020	2.329**	-0.011	0.033	-0.0011	-0.028	0.019	0.007	0.024
Q	107	0.123	2.319**	0.054	0.030	-0.0018	-0.065	-0.065	-0.081	-0.128*
R	104	0.033	2.012**	-0.035	0.075	0.0011	0.053	-0.018	0.008	0.002
S	104	0.010	2.383**	0.002	0.004	-0.0018	0.008	0.005	-0.005	0.015
T	103	0.058	2.654**	0.007	0.026	-0.0040	-0.045	0.010	-0.006	-0.040
U	103	0.045	2.574**	-0.068	0.024	-0.0020	0.002	0.009	-0.057	-0.053
V	104	0.028	2.650**	-0.043	-0.023	0.0002	-0.025	0.020	-0.041	-0.060
W	107	0.071	2.029**	-0.042	0.094	-0.0019	0.042	0.026	0.053	-0.013
X	107	0.092	2.065**	-0.015	0.074	-0.0009	0.091	0.008	-0.144	-0.132
Y	100	0.086	1.950**	-0.018	0.078	-0.0018	0.084	0.024	-0.033	-0.118

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: General surgery

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	70	0.038	2.782**	-0.026	0.026	0.0005	-0.021	0.081	0.068	0.045
B	97	0.065	1.518**	-0.122	0.093	-0.0002	0.054	0.082	0.117	0.084
C	38	0.232	1.476**	-0.226	-0.002	0.0001	0.080	0.262	0.207	0.178
D	101	0.074	2.312**	-0.004	0.024	0.0045	0.011	0.038	0.059	0.003
E	97	0.054	2.044**	0.071	-0.008	-0.0039	0.035	-0.027	0.028	-0.058
F	36	0.193	1.627**	-0.090	0.411	-0.0056	-0.096	0.117	0.027	0.027
G	101	0.024	2.594**	0.024	-0.031	0.0020	0.021	0.023	-0.005	0.006
H	102	0.031	2.121**	-0.016	0.036	-0.0004	-0.023	-0.056	-0.029	-0.016
I	102	0.039	1.497**	-0.125	-0.017	-0.0017	0.051	-0.020	0.039	0.008
J	55	0.180	2.246**	0.023	-0.111	-0.0017	-0.214	0.060	-0.062	0.069
K	100	0.042	2.338**	-0.001	0.030	0.0009	-0.044	0.004	-0.009	-0.049
L	58	0.122	2.369**	-0.044	0.023	0.0006	-0.042	0.129	0.037	-0.010
M	60	0.102	1.965**	-0.043	0.120	-0.0059	0.074	-0.091	-0.055	0.007
N	81	0.200*	1.835**	0.022	-0.113	-0.0070*	0.208	-0.040	0.107	0.281*
O	91	0.060	1.701**	0.036	-0.013	-0.0055	0.053	0.185	0.065	-0.072
P	71	0.048	1.878**	-0.122	-0.018	-0.0079	0.006	-0.042	-0.029	-0.108
Q	102	0.046	1.419**	0.017	-0.013	-0.0074	0.019	-0.108	-0.102	-0.198
R	102	0.086	1.588**	-0.071	-0.050	-0.0104	0.111	0.007	-0.099	-0.101
S	102	0.080	1.862**	-0.105	0.050*	-0.0103	0.070	-0.117	-0.150	-0.181
T	101	0.058	1.928**	-0.073	0.006	-0.0062	0.055	-0.198	-0.176	-0.134
U	101	0.049	1.530**	-0.004	-0.095	-0.0076	-0.014	-0.136	-0.144	-0.209
V	96	0.127	2.561**	-0.090	-0.109**	-0.0149	0.046	-0.101	-0.019	-0.021
W	103	0.130	2.249**		-0.114**	-0.0126	0.120	-0.161	-0.139	-0.143
X	73	0.123	1.930**	-0.185	0.089	0.0004	0.107	-0.180	-0.113	-0.202
Y	95	0.069	2.673**	-0.070	-0.232	-0.0066	0.000	-0.185	-0.178	-0.136

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Internal medicine

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	101	0.087	2.680**	0.089	0.019	-0.0006	-0.060	-0.022	-0.034	0.055
B	101	0.029	1.886**	0.006	0.050	-0.0002	0.020	-0.062	0.010	-0.067
C	93	0.103	2.257**	0.066	-0.079	-0.0040	0.013	-0.102	-0.068	-0.161
D	89	0.122	2.408**	0.042	-0.058	-0.0058	-0.054	-0.045	-0.085	-0.173*
E	84	0.050	1.523**	0.087	-0.077	-0.0012	0.019	0.033	0.026	0.039
F	98	0.251**	2.362**	0.132**	0.097*	-0.0031	-0.044	-0.213**	-0.109*	-0.146**
G	100	0.074	2.504**	0.129**	0.030	0.0000	-0.013	-0.006	0.006	0.019
H	100	0.081	1.674**	0.056	0.038	0.0029	0.106*	0.072	0.069	0.074
I	100	0.034	2.053**	0.063	0.018	-0.0004	-0.019	-0.003	0.002	-0.021
J	99	0.088	2.313**	0.042	0.028	-0.0019	-0.010	-0.054	0.027	-0.069
K	101	0.042	2.453**	0.034	0.038	-0.0024	-0.006	-0.058	0.019	0.000
L	100	0.143*	2.443**	0.035	0.054	-0.0069**	-0.054	-0.099	-0.040	-0.034
M	100	0.057	2.476**	0.071	0.061	0.0003	-0.040	-0.046	-0.006	0.014
N	100	0.040	2.189**	0.041	-0.006	-0.0010	-0.064	-0.059	-0.046	-0.019
O	100	0.056	2.229**	0.035	-0.009	-0.0013	-0.052	-0.034	0.051	-0.022
P	93	0.180*	1.893**	0.129*	-0.014	0.0008	-0.064	0.010	0.203**	0.040
Q	94	0.079	2.422**	0.074	0.053	-0.0034	-0.048	-0.064	-0.013	0.002
R	101	0.114	2.473**	0.060	0.068	-0.0021	-0.041	-0.073	0.044	0.049
S	101	0.1096	2.101**	0.107	0.080	-0.0005	-0.088	-0.027	0.049	-0.008
T	101	0.181**	1.957**	0.172**	0.161**	0.0007	-0.042	-0.067	0.105	0.028
U	100	0.106	1.713**	-0.063	0.099	0.0026	0.004	-0.007	0.152	-0.010
V	101	0.030	1.779**	-0.075	0.026	0.0004	0.029	0.070	0.091	0.045
W	100	0.029	2.106**	0.054	-0.006	0.0003	0.045	-0.006	0.061	-0.047
X	95	0.118	1.893**	-0.001	0.101	-0.0002	0.075	-0.118	0.130	0.016

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Oral and maxillofacial surgery

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	113	0.070	3.342**	-0.056	-0.046	0.0050	-0.035	-0.139	0.026	0.103
B	115	0.096	1.684**	-0.101	-0.094	0.0013	-0.122	-0.100	-0.003	-0.093
C	115	0.088	2.475**	-0.018	0.005	0.0037	-0.031	-0.120*	0.020	0.010
D	115	0.110	2.524**	-0.028	0.016	0.0031	-0.019	-0.093	0.023	0.107
E	106	0.041	2.063**	-0.006	0.064	0.0014	-0.043	-0.043	0.053	-0.022
F	110	0.032	1.912**	0.016	0.146	-0.0040	-0.003	0.079	0.057	0.018
G	116	0.061	2.358**	0.000	-0.032	0.0017	-0.071	-0.029	0.090	0.110
H	117	0.113	1.840**	0.066	0.034	-0.0090**	-0.051	-0.030	0.066	0.047
I	113	0.070	3.144**	-0.042	-0.066	0.0067	-0.073	-0.141	-0.028	0.036
J	113	0.139*	1.812**	0.065	0.110	-0.0065**	-0.005	0.042	0.125*	0.110
K	113	0.029	2.175**	-0.043	0.150	-0.0026	-0.034	-0.061	-0.027	-0.083
L	115	0.092	1.955**	-0.038	-0.025	-0.0068*	-0.133*	0.023	0.038	-0.001
M	96	0.042	2.183**	0.031	0.069	0.0000	-0.095	0.032	-0.008	-0.067
N	110	0.086	2.103**	0.104	0.052	-0.0072	-0.061	0.159	0.134	0.086
O	104	0.120	2.682**	0.003	-0.020	0.0018	-0.225**	-0.142	-0.051	-0.052
P	117	0.099	2.566**	-0.051	0.008	0.0060	0.024	-0.008	0.075	0.187*
Q	117	0.051	3.005**	-0.105	0.003	0.0028	0.022	0.017	0.015	0.144
R	116	0.113	1.497**	-0.097	0.109	0.0017	-0.087	-0.114	0.015	-0.175
S	97	0.045	1.948**	-0.012	0.012	0.0012	-0.143	-0.021	0.031	-0.003
T	114	0.058	3.028**	-0.145	0.045	0.0027	-0.015	-0.040	-0.036	0.088
U	55	0.198	2.337**	0.042	0.369*	-0.0028	0.091	0.151	0.247	0.077
V	96	0.065	2.735**	-0.018	0.065	0.0023	-0.070	-0.005	0.034	0.178
W	102	0.064	2.993**	-0.041	-0.056	0.0047	0.036	-0.049	0.064	0.175

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Obstetrics and gynecology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	88	0.065	2.007**	-0.149	0.014	0.0022	0.105	-0.016	0.046	0.158
B	89	0.101	1.671**	-0.192	-0.009	0.0025	0.111	-0.127	-0.081	0.047
C	89	0.135	2.068**	-0.125	-0.105	-0.0008	0.150	0.088	0.155	0.252*
D	89	0.148	2.082**	-0.256**	-0.137	-0.0007	0.142	-0.006	0.046	0.105
E	88	0.137	2.154**	-0.076	0.083	0.0029	0.151*	0.112	-0.033	0.265*
F	87	0.135	2.325**	-0.023	0.139	-0.0009	0.189**	0.149	-0.010	0.180
G	86	0.132	2.279**	-0.077	0.131	-0.0015	0.166*	0.236*	0.100	0.282**
H	86	0.097	2.410**	0.056	0.063	-0.0004	0.120	0.209	0.017	0.157
I	88	0.079	2.356**	-0.042	0.048	0.0018	0.062	0.092	0.025	0.132*
J	87	0.104	2.575**	-0.022	-0.022	0.0067*	0.013	0.004	-0.042	0.084
K	88	0.113	1.764**	-0.212*	0.052	0.0021	0.145*	-0.011	0.024	0.110
L	88	0.095	2.158**	-0.231*	-0.057	-0.0006	0.089	0.049	0.052	0.107
M	89	0.089	2.124**	-0.015	0.117	0.0039	0.059	0.079	0.038	0.161
N	82	0.178*	2.321**	-0.255**	-0.118	0.0009	0.015	0.013	0.007	0.016
O	81	0.039	2.207**	0.034	0.041	0.0035	0.026	-0.017	-0.014	0.024
P	87	0.162*	1.834**	-0.171*	-0.095	-0.0017	0.149*	-0.036	0.037	0.099
Q	88	0.107	2.381**	-0.039	0.087	0.0051	-0.025	0.029	0.005	0.158
R	58	0.236*	2.504**	-0.143	-0.234*	-0.0013	0.050	0.015	-0.067	-0.157
S	68	0.073	2.260**	-0.126	-0.104	0.0002	-0.006	-0.041	0.007	-0.025
T	88	0.205**	1.941**	-0.205*	-0.089	-0.0002	0.088	-0.188	-0.154	-0.252**
U	87	0.125	2.125**	-0.202*	-0.049	-0.0029	0.137	-0.008	0.016	0.041
V	88	0.117	2.606**	-0.070	-0.006	0.0056	0.009	0.077	0.017	0.185*
W	49	0.108	2.120**	-0.167	0.004	0.0049	0.026	0.067	0.072	0.079
X	88	0.133	2.379**	-0.243	-0.115	0.0006	0.080	-0.063	-0.002	0.109
Y	27	0.253	2.256**	0.008	0.143	-0.0073	0.006	0.225	0.018	0.180
Z	85	0.136	2.325**	-0.194	-0.153	-0.0014	0.105	-0.077	-0.062	-0.037

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Ophthalmology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	71	0.088	3.345**	-0.104	0.028	0.0017	-0.063	0.087	0.235*	0.158
B	98	0.109	1.852**	-0.028	-0.096	0.0066	-0.083	-0.062	0.138	0.118
C	97	0.125	2.089**	-0.026	-0.157	0.0070	-0.027	-0.018	0.094	0.186
D	97	0.143*	2.378**	-0.019	-0.202	0.0031	-0.012	0.086	0.168*	0.257**
E	92	0.054	2.962**	0.032	0.077	-0.0010	-0.063	0.130	0.028	0.145
F	95	0.162*	2.115**	-0.048	-0.242	0.0057	-0.005	-0.160	-0.034	0.168
G	90	0.271**	1.645**	-0.138	0.672**	-0.0006	-0.043	-0.005	0.054	0.062
H	73	0.121	2.323**	-0.113	0.092	0.0001	-0.066	-0.062	0.048	0.092
I	84	0.117	3.067**	-0.040	0.055	-0.0077	0.006	0.050	-0.083	0.077
J	94	0/051	3.248**	-0.026	0.045	-0.0035	-0.076	0.106	0.011	0.134
K	93	0.113	3.138**	-0.054	0.028	-0.0054	-0.065	0.066	-0.040	0.112
L	92	0.084	3.193**	-0.021	0.070	-0.0082	0.007	0.047	0.008	0.131
M	61	0.091	3.466**	-0.138	0.044	-0.0043	-0.015	0.009	-0.021	0.113
N	72	0.097	2.796**	-0.007	0.254	-0.0023	-0.093	0.076	0.081	0.242
O	88	0.081	2.327**	0.036	-0.063	0.0053	-0.112	0.008	-0.025	0.082
P	86	0.150	2.012**	-0.218	-0.010	0.0086	-0.065	-0.228*	-0.033	0.045
Q	74	0.108	2.204**	-0.001	0.167	-0.0002	-0.052	-0.021	-0.077	0.060
R	58	0.135	1.767**	0.046	0.200	0.0023	-0.174	0.205	0.095	0.095
S	96	0.118	2.024**	-0.197	-0.156	0.0032	0.038	-0.101	0.162	0.044
T	40	0.307	2.549**	-0.056	0.525	-0.0108	0.177	0.021	0.072	0.479*
U	90	0.101	2.765**	-0.076	0.126	-0.0049	0.167*	0.001	-0.033	0.125

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Orthopedic surgery

<u>Task</u>	<u>N¹</u>	<u>R-Square</u>	<u>Intercept</u>	<u>Board certified</u>	<u>Salaried or fee for service</u>	<u>Years since medical school</u>	<u>Residency program in hospital</u>	<u>Region</u>		
								<u>Midwest</u>	<u>South</u>	<u>West</u>
A	104	0.065	2.834**	-0.041	0.067	-0.0004	-0.005	0.103	0.005	0.080
B	105	0.220	2.157**	0.050	-0.546**	-0.0088	-0.026	-0.257	-0.139	-0.188
C	102	0.065	2.262**	-0.133*	0.060	0.0016	0.036	0.042	0.030	0.000
D	100	0.077	2.374**	-0.117	0.062	0.0032	0.033	0.115	0.054	0.059
E	86	0.106	2.560**	0.017	0.114	0.0031	-0.028	0.087	-0.010	0.119
F	105	0.040	2.565**	-0.042	0.019	0.0012	0.042	0.098	0.073	0.144
G	100	0.061	2.456**	-0.134	-0.050	0.0011	0.042	0.139	0.074	0.145
H	99	0.120	1.224**	-0.249*	-0.341*	0.0033	-0.017	-0.041	-0.027	-0.058
I	104	0.169	2.404**	-0.114	-0.534**	-0.0024	-0.034	-0.008	-0.099	-0.026
J	104	0.035	2.597**	-0.092	-0.235	-0.0029	-0.084	-0.048	-0.023	-0.111
K	106	0.105	1.909**	-0.135	-0.363*	-0.0031	0.030	0.026	0.025	0.016
L	103	0.165	1.899**	-0.171	-0.473**	-0.0007	-0.019	-0.196	-0.002	-0.106
N	104	0.102	1.900**	-0.148	-0.291*	0.0000	0.009	-0.047	0.046	0.059
O	105	0.081	1.562**	-0.056	-0.315	0.0027	0.090	-0.113	0.134	0.012
P	105	0.083	1.451**	-0.162	-0.224	0.0004	0.083	-0.071	0.143	-0.025
Q	106	0.101	1.490**	-0.178	-0.220	-0.0001	0.105	-0.079	0.161	-0.033
R	107	0.086	1.724**	-0.159	-0.280*	0.0027	-0.002	-0.002	-0.013	-0.053
S	68	0.129	2.410**	-0.077	-0.221	-0.0071	-0.029	-0.068	-0.159	0.021
T	85	0.128	2.726**	0.058	0.116	0.0002	-0.085	0.117	-0.050	0.073
U	105	0.174	1.597**	-0.234	-0.348*	0.0075	0.118	-0.187	0.105	-0.087

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Otolaryngology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	97	0.088	3.001**	0.028	-0.059	-0.0025	0.069	0.073	0.008	0.065
B	104	0.057	1.590**	-0.179	0.066	-0.0030	-0.066	-0.017	-0.087	-0.045
C	103	0.056	1.625**	-0.108	0.202	-0.0015	0.031	-0.102	-0.082	-0.120
D	104	0.182	1.626**	-0.040	0.138*	0.0003	0.121	0.006	-0.026	0.067
E	84	0.073	2.104**	-0.048	0.034	-0.0037	0.053	0.025	0.042	0.118
F	95	0.076	2.580**	0.019	0.089	-0.0012	0.033	-0.118	-0.008	0.049
G	102	0.114	2.275**	-0.030	-0.104	-0.0049*	0.011	0.074	0.014	0.070
H	99	0.035	2.866**	0.030	-0.078	-0.0018	-0.007	0.008	0.023	0.050
I	105	0.067	1.970**	-0.208	0.023	-0.0008	-0.045	-0.092	0.062	-0.069
J	103	0.098	1.611**	-0.293**	-0.023	0.0013	0.020	-0.097	-0.112	-0.224*
K	89	0.094	1.601**	-0.292*	0.062	0.0032	-0.071	-0.007	0.028	-0.092
L	97	0.100	2.975**	0.043	-0.111	-0.0015	-0.005	-0.036	-0.112*	-0.095
M	105	0.183	2.614**	0.016**	-0.282	-0.0053	-0.015**	0.220	0.115	0.142
N	104	0.067	1.999**	-0.254*	-0.048	-0.0017	-0.012	-0.088	0.002	-0.117
O	76	0.135	2.562**	-0.078	-0.188**	0.0041	-0.043	0.060	0.024	0.044
P	19	0.459	3.102**	-0.150	-0.239	0.0140	-0.025	-0.100	-0.527	-0.030
Q	27	0.389	3.411**	-0.094	-0.302**	0.0022	-0.053	-0.002	-0.210	0.037
R	103	0.058	2.001**	-0.012	0.021	-0.0023	0.074	-0.080	-0.050	-0.048
S	95	0.049	2.098**	-0.246	-0.161	0.0026	-0.063	0.009	0.002	-0.048
T	104	0.066	2.275**	0.038	-0.024	-0.0008	0.037	0.045	-0.003	0.094
U	103	0.036	1.718**	-0.109	-0.072	0.0004	0.049	0.050	-0.046	-0.031

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Pathology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	111	0.131*	2.592**	0.429**	0.014	0.0026	-0.081	-0.114	0.016	0.085
B	110	0.038	1.465**	0.136	0.065	0.0005	0.034	0.004	0.070	0.018
C	113	0.042	2.723**	0.077	0.022	-0.0016	-0.079	-0.099	-0.038	0.049
E	115	0.051	2.384**	0.158	0.003	0.0020	-0.043	-0.129	-0.145	-0.086
F	91	0.044	2.445**	-0.142	0.016	-0.0010	0.041	-0.130	-0.134	-0.179
G	113	0.048	2.514**	0.011	0.027	0.0013	0.039	-0.134	-0.124	-0.003
H	109	0.086	2.152**	0.235	-0.071	-0.0058	0.053	0.006	-0.016	-0.012
I	115	0.081	2.656**	0.119	0.082	-0.0034	-0.020	-0.120	-0.026	0.071
J	105	0.059	2.805**	0.019	-0.010	-0.0021	-0.043	-0.115	-0.064	0.061
K	89	0.114	2.727**	0.113	0.042	-0.0042	-0.068	-0.162	-0.106	0.069
L	115	0.034	2.516**	0.124	0.045	-0.0030	-0.004	-0.048	-0.071	0.020
M	115	0.136*	2.616**	0.286*	0.053	-0.0021	-0.129*	-0.131	-0.177*	-0.079
N	96	0.091	2.600**	0.153	0.023	-0.0034	-0.031	-0.175	-0.099	0.054
O	113	0.061	2.838**	0.061	-0.007	-0.0034	-0.145*	-0.112	-0.107	-0.056
P	82	0.053	2.246**	0.127	0.018	-0.0026	-0.066	-0.200	-0.129	-0.255
Q	114	0.047	2.462**	0.141	-0.016	-0.0020	-0.073	-0.086	-0.075	-0.129
R	109	0.021	2.302**	-0.105	-0.066	-0.0001	-0.040	0.041	-0.004	-0.009

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Pediatrics

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	90	0.102	2.724**	0.154	0.068	-0.0046	-0.022	-0.051	-0.115	-0.030
B	101	0.132	1.541**	0.069	0.048	0.0030	-0.017	0.067	0.110*	0.104
C	103	0.085	2.258**	0.079	-0.015	-0.0029	0.031	-0.068	-0.075	-0.071
D	102	0.147*	2.345**	0.079	-0.013	-0.0039	0.036	-0.097	-0.124**	-0.091
E	102	0.147*	2.354**	0.133*	-0.030	-0.0011	0.029	-0.055	-0.133**	-0.090
F	102	0.110	2.436**	0.080	-0.014	0.0007	0.016	-0.082	-0.162**	-0.077
G	103	0.128	2.572**	0.145*	0.034	-0.0037	0.032	0.014	-0.097	-0.029
H	101	0.142*	2.420**	0.155**	0.010	-0.0046*	0.038	0.069	-0.027	-0.051
I	102	0.095	2.446**	0.053	-0.038	-0.0028	0.021	0.013	-0.076	-0.114
J	102	0.073	2.084	0.079	-0.110	-0.0027	0.000	0.068	0.073	-0.126
K	90	0.028	2.459**	0.000	-0.011	0.0041	0.030	-0.023	-0.073	-0.034
L	102	0.044	2.554**	0.098	-0.008	-0.0029	0.025	0.003	0.033	-0.058
N	101	0.043	2.299**	0.115	0.065	-0.0023	0.011	0.053	-0.004	0.043
O	101	0.146*	2.529**	0.105	-0.013	-0.0062**	-0.018	0.055	-0.033	-0.102
P	92	0.126	2.216**	0.066	0.091	-0.0062*	0.089*	0.093	0.066	0.030
Q	91	0.128	2.070**	-0.075	-0.089	-0.0066	0.033	-0.070	-0.073	-0.063
R	102	0.036	1.919**	0.061	0.007	0.0016	-0.009	-0.035	0.028	-0.021
S	101	0.115	2.298**	0.135**	0.037	-0.0024	0.032	0.055	-0.027	0.004
T	103	0.130	2.011**	-0.022	-0.080	-0.0075**	0.026	-0.060	-0.051	-0.061
U	101	0.042	2.177**	0.071	-0.049	-0.0031	0.042	0.052	0.007	0.034

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Psychiatry

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	98	0.090	2.518**	0.010	0.026	-0.0054*	0.041	0.072	0.077	-0.039
B	100	0.042	1.835**	-0.108	0.067	-0.0024	0.047	-0.027	-0.085	-0.036
C	95	0.052	1.975**	-0.007	-0.011	0.0002	0.005	0.015	0.054	0.038
D	99	0.164*	2.133**	0.082	-0.007	-0.0032	0.089*	0.021	0.078	0.143**
E	97	0.055	2.112**	-0.001	-0.112	0.0011	0.063	0.037	0.073	0.060
F	99	0.044	1.824**	-0.016	0.034	-0.0039	-0.015	-0.002	-0.034	0.043
G	97	0.038	1.971**	0.002	-0.003	0.0020	0.057	-0.049	0.014	0.014
H	96	0.045	1.966**	0.036	-0.043	-0.0005	0.008	0.090	0.027	0.052
I	98	0.025	2.127**	0.018	0.007	-0.0013	0.031	0.062	0.030	0.044
J	86	0.118	2.204**	0.013	-0.033	-0.0006	0.034	0.051	0.179**	0.055
K	87	0.032	2.121**	0.019	0.015	0.0008	0.027	0.008	0.056	-0.009
L	98	0.118	2.387**	0.026	-0.003	-0.0075**	0.021	0.042	0.049	0.051
M	99	0.048	2.280**	0.044	0.001	-0.0036	0.007	0.046	-0.003	0.021
N	99	0.112	2.267**	0.036	-0.002	-0.0048**	0.030	0.029	0.061	0.085
O	99	0.049	1.927**	-0.057	-0.018	0.0002	-0.025	-0.115	-0.022	0.036
P	63	0.163	2.182**	-0.105	-0.116	-0.0090	0.124	0.126	0.185	0.252
Q	96	0.169*	2.568**	0.056	0.055	-0.0064**	0.047	0.007	0.124*	-0.014
R	98	0.100	2.263**	-0.017	-0.090	-0.0036	0.026	0.071	0.120	0.058
S	99	0.047	2.202**	-0.025	-0.018	-0.0027	0.029	0.035	0.030	0.044
T	95	0.089	2.290**	-0.037	0.008	-0.0019	0.071	0.043	0.091	-0.013
U	91	0.090	2.165**	-0.094*	0.005	-0.0014	0.036	-0.029	-0.013	0.028
V	96	0.181**	2.360**	0.035	0.076	-0.0054*	0.109*	0.042	0.180**	0.032
W	96	0.057	2.213**	-0.010	0.003	-0.0014	0.060	-0.036	0.076	0.053
X	93	0.113	2.202**	-0.062	0.036	-0.0021	0.054	-0.241**	-0.023	0.019

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Radiology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	94	0.198**	2.636**	0.306**	0.073	-0.0044*	0.016	-0.019	0.028	0.006
B	115	0.080	1.666**	-0.086	0.010	-0.0034	-0.060	-0.062	0.027	-0.021
C	116	0.125	1.718**	-0.088	0.038	-0.0014	-0.074	0.027	0.069	-0.099
D	116	0.074	2.262**	-0.057	0.004	-0.0013	0.003	-0.017	0.027	-0.055
E	107	0.043	2.229**	0.088	0.006	-0.0041	-0.001	0.022	0.002	-0.026
F	106	0.055	2.186**	0.067	0.111	-0.0057	0.043	-0.022	0.028	0.042
G	104	0.152	2.348**	0.083	-0.071	-0.0071**	0.027	0.027	0.092	0.113
H	89	0.139	2.224**	0.292*	0.097	-0.0040	-0.002	0.077	0.084	0.053
I	115	0.065	1.456**	-0.050	0.007	-0.0023	0.072	-0.118	0.029	-0.032
J	112	0.070	2.190**	-0.087	-0.006	-0.0031	-0.036	-0.158	-0.062	-0.177*
K	47	0.190	1.740**	0.421	0.131	0.0026	0.050	0.106	0.174	0.096
L	115	0.108	1.657**	-0.112	0.059	0.0021	-0.042	-0.012	0.070	-0.032
M	115	0.099	2.225**	0.128	0.056	-0.0021	0.024	-0.121*	-0.054	-0.081
N	113	0.101	2.252**	0.130	0.020	-0.0028	0.019	-0.131*	-0.057	-0.186**
O	115	0.025	1.654**	-0.047	0.019	0.0013	-0.033	-0.062	-0.034	-0.008
P	46	0.180	2.275**	-0.529	0.030	-0.0094	0.150	0.032	-0.026	0.220
Q	116	0.051	1.663**	-0.049	-0.003	0.0019	-0.001	-0.046	0.059	-0.047
R	98	0.077	2.030**	0.040	0.043	0.0007	0.093	-0.071	0.082	0.077
S	105	0.076	2.286**	0.186	0.098	-0.0038	0.060	-0.041	-0.014	0.004
T	115	0.043	1.564**	0.067	-0.055	-0.0012	-0.020	-0.035	0.048	-0.075

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Rheumatology

<u>Task</u>	<u>N¹</u>	<u>R-Square</u>	<u>Intercept</u>	<u>Board certified</u>	<u>Salaried or fee for service</u>	<u>Years since medical school</u>	<u>Residency program in hospital</u>	<u>Region</u>		
								<u>Midwest</u>	<u>South</u>	<u>West</u>
A	116	0.081	2.698**	0.137	-0.004	-0.0015	-0.043	0.020	-0.044	0.015
B	117	0.111	1.782**	-0.190	0.117	0.0006	-0.095	-0.005	-0.016	-0.133
C	117	0.038	2.462**	0.078	0.029	0.0003	-0.046	0.027	-0.011	0.022
D	117	0.052	2.656**	0.038	0.019	-0.0012	-0.025	0.002	-0.065	0.043
E	116	0.043	2.096**	-0.076	0.034	0.0002	0.019	-0.065	-0.125	-0.089
F	101	0.097	1.949**	-0.016	0.019	0.0066	-0.040	-0.047	-0.171*	-0.124
G	117	0.080	2.092**	-0.155	0.095	-0.0049	-0.033	0.085	-0.053	-0.086
H	118	0.022	2.503**	-0.012	0.060	-0.0026	-0.006	0.023	0.002	0.005
I	115	0.033	2.293**	-0.043	0.029	-0.0025	-0.037	-0.014	-0.038	-0.041
J	116	0.033	2.363**	-0.013	0.048	-0.0037	0.003	0.012	-0.005	0.009
K	118	0.074	2.717**	0.131	-0.034	-0.0037	0.004	0.005	-0.041	0.007
L	74	0.197*	1.935**	-0.463**	0.101	0.0052	-0.072	0.183	0.212	0.177
M	116	0.068	2.260**	-0.096	0.077	-0.0004	-0.049	0.029	-0.026	0.027
N	117	0.094	2.019**	-0.088	0.079	0.0022	-0.085	0.046	0.005	0.057
O	115	0.047	2.428**	0.049	0.073	-0.0021	0.013	0.013	0.012	0.068
P	115	0.110	1.563**	-0.187	0.118	-0.0059	-0.106	0.083	0.117	0.016
Q	117	0.092	1.715**	-0.081	0.083	0.0014	-0.138*	-0.047	0.034	-0.036
R	113	0.105	1.417**	-0.198	0.132	-0.0020	-0.086	0.092	0.081	-0.062

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Thoracic and cardiovascular surgery

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	80	0.099	2.674**	0.172	-0.037	0.0017	0.074	-0.006	0.034	0.131
B	94	0.064	1.820**	-0.045	-0.110	-0.0023	-0.044	-0.010	0.018	-0.036
C	93	0.041	1.489**	-0.075	-0.137	-0.0027	-0.030	-0.182	-0.179	-0.155
D	78	0.072	2.757**	-0.054	-0.063	0.0036	0.029	0.034	0.015	0.109
E	82	0.066	1.525**	0.187	-0.151	-0.0063	-0.034	0.084	0.016	-0.149
F	93	0.089	1.953**	0.084	-0.278*	-0.0015	-0.062	-0.058	-0.164	-0.182
G	90	0.118	1.985**	0.086	-0.219*	-0.0003	-0.026	0.028	-0.107	0.052
H	89	0.055	2.526**	0.152	-0.054	-0.0014	-0.020	0.051	-0.038	0.005
I	80	0.065	2.590**	0.116	-0.117	0.0030	-0.020	0.094	0.020	0.109
J	90	0.055	2.373**	-0.101	-0.071	-0.0050	-0.054	0.013	-0.022	-0.034
K	90	0.166*	1.992**	0.155	-0.399**	0.0010	-0.124	-0.066	-0.234	-0.072
L	94	0.102	1.900**	-0.048	-0.236*	-0.0035	-0.076	0.064	0.016	0.007
M	92	0.072	1.779**	0.075	-0.257*	0.0035	-0.068	0.178	0.071	0.095
N	88	0.076	1.847**	-0.039	-0.258	0.0052	-0.067	0.002	-0.185	-0.046
O	76	0.051	2.387**	0.102	-0.056	0.0022	-0.003	0.037	-0.015	0.100
P	60	0.145	2.266**	0.337*	-0.106	0.0036	0.053	0.107	0.094	0.148
Q	83	0.103	2.250**	0.012	-0.184	0.0079	-0.158	0.157	0.151	0.107
R	94	0.163	2.473**	0.023	-0.231**	-0.0057	-0.032	-0.123	-0.123	-0.141
S	86	0.081	2.436**	0.276*	-0.085	0.0036	-0.004	0.084	0.048	0.130
T	79	0.077	2.364**	0.251	-0.020	0.0044	0.041	0.053	0.068	0.126
U	82	0.096	1.944**	0.122	-0.209	-0.0026	-0.019	-0.207	-0.229	-0.198

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 42 continued

Results from a regression of physician characteristics and type of practice on intra-service work, by service: Urology

Task	N ¹	R-Square	Intercept	Board certified	Salaried or fee for service	Years since medical school	Residency program in hospital	Region		
								Midwest	South	West
A	112	0.076	3.407**	0.233*	-0.047	-0.0044	-0.092	-0.032	0.004	-0.006
B	109	0.098	1.673**	-0.235*	0.135	0.0005	0.025	0.030	-0.130	0.055
C	112	0.102	2.767**	0.153	-0.178	-0.0022	-0.027	0.045	0.065	0.183*
D	112	0.058	1.982**	0.001	0.014	-0.0031	0.101	0.019	-0.109	-0.057
E	100	0.094	2.825**	0.164	-0.108	0.0003	-0.089	0.069	0.103	-0.074
F	111	0.015	2.103**	0.029	0.001	-0.0019	-0.007	0.013	-0.075	-0.073
G	114	0.055	1.987**	0.045	0.002	-0.0030	0.084	0.044	-0.100	0.080
H	114	0.050	2.970**	0.122	-0.073	-0.0018	-0.004	0.013	0.018	0.133
I	106	0.064	1.995**	-0.013	0.008	-0.0001	-0.013	0.068	0.041	-0.010
J	114	0.021	1.994**	0.026	0.080	-0.0006	0.014	0.058	-0.051	0.042
K	54	0.083	3.002**	0.004	-0.173	-0.0040	-0.100	-0.113	-0.020	0.022
L	88	0.042	3.183**	0.106	-0.124	-0.0041	-0.029	0.074	0.039	0.130
M	65	0.067	3.051**	0.064	0.073	-0.0038	-0.007	-0.104	-0.088	0.060
N	112	0.066	2.989**	0.154	-0.124	-0.0047	-0.015	0.005	0.088	0.132
O	114	0.029	2.110**	-0.065	-0.078	-0.0001	0.019	0.089	-0.032	0.028
P	99	0.029	2.287**	-0.052	-0.073	-0.0011	-0.033	-0.102	-0.064	-0.058
Q	110	0.031	2.404**	0.031	0.036	-0.0017	-0.020	-0.023	-0.057	0.010
R	76	0.071	2.071**	-0.201	-0.156	-0.0005	-0.008	-0.073	-0.112	-0.039
S	107	0.067	2.235**	-0.144	0.072	-0.0004	0.083	0.040	-0.104	-0.006
T	70	0.094	2.948**	0.059	-0.214	-0.0035	0.015	-0.054	-0.004	0.105
U	97	0.043	2.511**	0.077	-0.066	-0.0048	0.029	-0.021	0.015	0.069

NOTE: * Statistically significant at the 5% level.

** Statistically significant at the 1% level.

Table 43

Specialty specific intra-service work and time for selected services¹

	Work			Time		
	Pilot survey	National survey		Pilot survey	National survey	
	Mean	S.E. ³	Mean	S.E.	Mean	S.E.
<u>Internal Medicine Services²</u>						
EOG with interpretation in a 50 year old male	96	9.4 %	80	6.9 %	9.4	9.0 %
Office visit, sore throat, fever and fatigue in 19 year old college student, established patient	100	-	100	5.7	13.6	4.7
Office phone consultation regarding possible adverse drug reaction in established patient	107	12.5	80	6.3	9.4	8.3
Follow-up visit of a 55 year old male for management of hypertension, mild fatigue, on beta blocker/thiazide regimen ⁴	153	12.5	123	-	15.4	4.0
Aspiration of synovial fluid from knee	180	9.1	166	6.6	15.1	6.8
Office evaluation of new onset right lower quadrant pain in a 32 year old woman, established patient	272	6.7	253	3.6	26.1	4.8
Hospital consultation for diagnosis/ management of fever following abdominal surgery	374	7.2	411	4.6	48.1	4.3
Management of patient in acute pulmonary edema in emergency room, who subsequently is admitted to hospital	518	7.3	650	4.6	56.6	5.1
Hospital visit, day 3 post admission, 65 year old male with uncomplicated MI, established patient	183	7.5	160	4.8	16.9	4.8
Rigid sigmoidoscopy, without biopsy, in office	193	10.2	165	6.4	18.3	9.0
Initial office evaluation of a 37 year old generally well male	230	7.7	164	6.3	38.4	5.5

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			Time		
	Mean	S.E.	Mean	S.E.	Mean	S.E.
<u>Internal Medicine Services², continued</u>						
Urinalysis with microscopic exam in office lab under your supervision, excluding collection	48	9.3	35	7.5	5.8	11.1
Phone consultation from patient at home, 1:30 A.M., regarding new onset of belching, abdominal pain, and nausea in 62 year old man	177	10.8	151	6.7	11.4	9.5
Direct hospital admission of a 62 year old smoker, established patient, with bronchitis in acute respiratory distress	413	7.5	352	4.9	50.6	5.9
Scheduled monthly nursing home visit to established patient with Organic Brain Syndrome	133	10.4	109	6.2	14.8	8.6
One supervisory conference with visiting nurse for antibiotic	117	9.0	104	6.8	14.2	7.1

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			Time		
	Pilot survey			National survey		
	Mean	S.E.	Mean	S.E.	Mean	S.E.
<u>General Surgery Services</u>						
Hospital visit, 3 days post uncomplicated cholecystectomy with common bile duct exploration	17	14.7 %	13	10.7 %	10.4	6.7 %
Rigid sigmoidoscopy, without biopsy, in office	23	7.8	23	6.8	10.7	8.3
Office evaluation of new onset right lower quadrant pain in 32 year old woman, established patient	40	14.4	31	9.9	24.2	5.5
Insertion of Swan-Ganz catheter	72	11.3	58	9.0	29.5	6.6
Uncomplicated indirect inguinal hernia repair, 45 year old male ⁴	100	-	100	-	46.0	4.6
Cholecystectomy for cholelithiasis	235	4.5	231	4.0	73.3	5.1
Abdominal hysterectomy for cancer in situ of cervix in 50 year old woman	247	5.5	255	4.9	95.5	4.2
Modified radical mastectomy	263	5.1	293	4.4	107.2	4.3
Low anterior resection for rectal carcinoma	445	5.2	447	4.1	163.7	3.5
Appendectomy for acute abdomen with unperforated appendicitis	133	3.8	124	3.5	43.0	5.1
Preoperative evaluation of new patient with primary hyperparathyroidism	46	14.5	47	11.4	31.0	6.0
Hospital admission, 45 year old female with acute cholecystitis	50	14.1	41	9.6	39.0	7.2

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			Time		
	Mean	S.E.	Mean	S.E.	Mean	S.E.
<u>Radiology Services</u>						
Interpretation of lumbar spine x-rays, complete radiograph exam, adult patient with low back pain	47	7.0 %	45	5.1 %	6.7	12.6 %
Upper GI series, air contrast technique with KUB for abdominal pain after meals with heme-positive stools, performance and interpretation ⁴	100	-	100	-	15.1	10.7
Intravenous urography, pyelography, including kidneys, ureters and bladder, patient with hematuria and flank pain, performance and interpretation	124	4.7	115	4.2	21.8	9.8
Hysterosalpingography, complete procedure, in 26 year old woman with infertility	124	9.6	153	6.0	21.6	8.6
Barium enema, double contrast, complete procedure, for occult gastrointestinal bleeding in a 55 year old male, performance and interpretation	167	4.5	153	3.0	23.8	6.4
Echography of the pregnant uterus, B-scan and/or real time, image documentation, complete, for questionable fetal abnormality, performance and interpretation	167	8.8	197	5.6	21.3	8.7
Venography, unilateral, complete procedure, for possible deep vein thrombosis of lower extremity, performance and interpretation	186	6.1	181	5.5	28.4	6.3
Interpretation of chest x-rays, two views, frontal and lateral, for cough and weight loss	32	8.2	31	4.8	4.0	14.7

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			Time		
	Mean	S.E. ³	Mean	S.E.	Mean	S.E.
<u>Radiology Services</u>						
Interpretation of mammography, bilateral, for 50 year old patient with pain in breasts	86	6.8	85	6.8	12.0	8.3
Interpretation of computerized axial tomography, abdomen; with contrast materials for patient with weight loss and questionable cancer of the pancreas	194	6.9	180	6.1	23.0	9.7
Interpretation of complete skull series for headaches in an adult	50	8.1	40	5.2	7.0	12.9
Interpretation of bone density study, dual photon absorptiometry of spine for possible osteoporosis	60	17.3	51	13.4	13.0	16.9
Interpretation of complete abdomen, including decubitus and/or erect views, for questionable intestinal obstruction	52	7.5	43	5.0	7.0	14.7
					6.0	13.3
					5.0	6.9

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			
	Pilot survey	National survey		
	Mean	S.E. ³	Mean	S.E.
<u>Anesthesiology Services⁵</u>				
Anesthesia for dilation and curettage of uterus	67	4.2 %	68	4.2 %
Anesthesia for cystoscopy	79	4.6	76	5.0
Anesthesia for inguinal hernia repair ⁴	100	-	100	-
Anesthesia for knee arthroscopy	106	4.0	110	2.8
Anesthesia for modified radical mastectomy	175	3.6	185	3.4
Anesthesia for transurethral resection of prostate	186	4.2	181	3.5
Anesthesia for colectomy	236	4.0	268*	3.7
Anesthesia for total hip replacement	321	4.5	306	3.9
Anesthesia for repair of abdominal aortic aneurysm	518	5.1	533	4.3
Anesthesia for cholecystectomy	213	3.7	211	3.3
Insertion of Swan Ganz catheter	160	9.0	143	6.5
Anesthesia for open reduction and internal fixation of hip fracture	228	4.2	243	3.5
Anesthesia for lens surgery, cataract extraction with or without insertion of prosthesis	152	6.5	154	5.5

Table 43 continued

Specialty specific intra-service work and time for selected services¹

	Work			
	Pilot survey		National survey	
	Mean	S.E. ³	Mean	S.E.
Anesthesiology Services ⁵				
Evaluation of 63 year old patient in intensive care unit with diabetes and chronic renal failure who develops Adult Respiratory Distress Syndrome 36 hours post mitral valve replacement	204	7.9	175	6.1
Injection of anesthetic substance, therapeutic, epidural, single, epidural block for pain	132	6.5	132	4.9
Consultation for a transfusion reaction in a patient with abrupt onset of fever and back pain	121	7.0	117	5.8

*Mean values from pilot and national surveys differ significantly at the 5% level.

¹The relative values of work are specialty-specific and cannot be compared across specialties.

²Different reference service and procedures were used for the internal medicine pilot and national surveys.

³S.E.'s are the approximate standard error as a percentage of the geometric mean.

⁴Reference service for the national survey.

⁵Comparison of time for anesthesiology is not shown due to a different specification between the two surveys for intra-service time.

Table 44

Reliability of ratings of intra-service work¹

<u>Specialty</u>	<u>Reliability</u>			
	<u>Pilot survey</u>		<u>National survey</u>	
	<u>Individual physician</u>	<u>Mean of sample of physicians</u>	<u>Individual physician</u>	<u>Mean of sample of physicians</u>
Anesthesiology	0.647	0.992	0.720	0.997
General Surgery	0.709	0.993	0.717	0.996
Internal Medicine	0.614	0.988	0.713	0.996
Radiology	0.740	0.994	0.784	0.998

¹ The reliability of the ratings for an individual physician is the intraclass correlation. The reliability of the mean ratings is calculated from the intraclass correlation using the Spearman-Brown prediction formula.

Table 45

Prediction of the mean ratings of intra-service work
from the mean ratings of its dimensions

The square of the multiple correlation coefficient (R-squared)		
<u>Specialty</u>	<u>Pilot survey</u>	<u>National survey</u>
Anesthesiology	0.994	0.993
General Surgery	0.999	0.996
Internal Medicine	0.990	0.988
Radiology	0.996	0.991

Table 46

Prediction of individual ratings of intra-service work from individual ratings of its dimensions controlling for physician and services

The square of the multiple correlation coefficient (R-Squared)		
<u>Specialty</u>	<u>Pilot survey</u>	<u>National survey</u>
Anesthesiology	0.845	0.872
General Surgery	0.909	0.887
Internal Medicine	0.860	0.836
Radiology	0.876	0.903

Table 47

Comparison of intra-service time from the national survey
with hospital operating room time¹

Service	Mean intra-service time national survey	Mean hospital operating room time
Decompression of carpal tunnel in 48 year old female, unilateral, ambulatory surgery unit	30.5	25.2
Carotid endarterectomy, unilateral, 58 year old female with history of transient ischemic attacks	99.4	91.0
Transurethral resection of prostate, medium sized gland for BPH (benign prostatic hypertrophy) in 70 year old male	64.6	56.4
Abdominal hysterectomy for cancer in situ of cervix in 50 year old	91.9	96.6
Diagnostic dilation and curettage for menometrorrhagia in 50 year old female	13.9	8.8
Primary total hip replacement for osteoarthritis	135.1	145.6
Modified radical mastectomy	109.4	106.8
Primary triple vessel coronary artery bypass graft, 65 year old male, ejection fraction=50%, with no complicating associated disease	202.1	194.7

¹Extreme high and low outliers were deleted. Outliers were defined as those time values that differed by more than three standard deviations from the mean of those remaining.



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